**OM-1500-6** 206 805A
April 2002

**Processes**

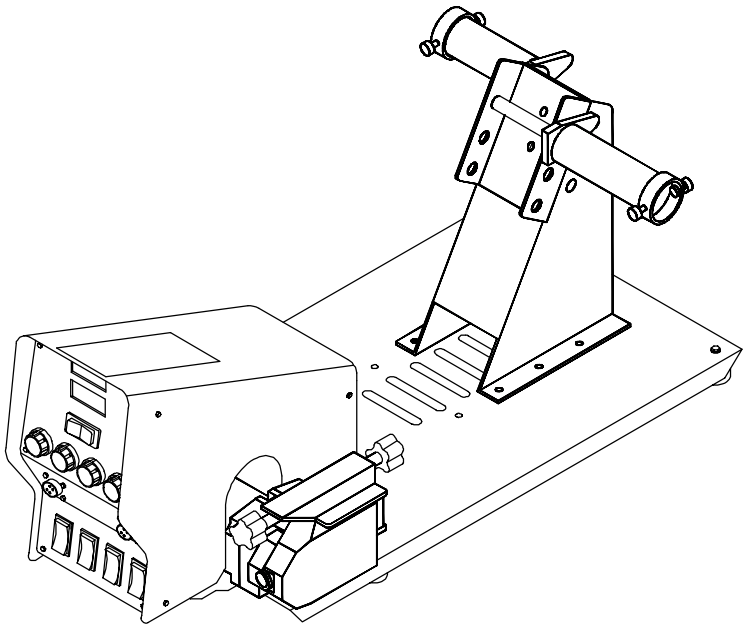
MIG (GMAW) Welding
Flux Cored (FCAW) Welding
(Gas- And Self-Shielded)

**Description**

CV

Wire Feeder

# D-74S, D-74D



## OWNER'S MANUAL

Visit our website at
**www.MillerWelds.com**

# From Miller to You

*Thank you* and *congratulations* on choosing Miller. Now you can get the job done and get it done right. We know you don't have time to do it any other way.

That's why when Niels Miller first started building arc welders in 1929, he made sure his products offered long-lasting value and superior quality. Like you, his customers couldn't afford anything less. Miller products had to be more than the best they could be. They had to be the best you could buy.

Today, the people that build and sell Miller products continue the tradition. They're just as committed to providing equipment and service that meets the high standards of quality and value established in 1929.

This Owner's Manual is designed to help you get the most out of your Miller products. Please take time to read the Safety precautions. They will help you protect yourself against potential hazards on the worksite. We've made installation and operation quick and easy. With Miller you can count on years of reliable service with proper maintenance. And if for some reason the unit needs repair, there's a Troubleshooting section that will help you figure out what the problem is. The parts list will then help you to decide the exact part you may need to fix the problem. Warranty and service information for your particular model are also provided.

ISO 9001 REGISTERED QUALITY SYSTEM

Miller is the first welding equipment manufacturer in the U.S.A. to be registered to the ISO 9001 Quality System Standard.

Miller Electric manufactures a full line of welders and welding related equipment. For information on other quality Miller products, contact your local Miller distributor to receive the latest full line catalog orindividual catalog sheets. **To locate your nearest distributor or service agency call 1-800-4-A-Miller, or visit us at www.MillerWelds.com on the web.**

TRUE BLUE® WARRANTY

Working as hard as you do – every power source from Miller is backed by the most hassle-free warranty in the business.

*Miller offers a Technical Manual which provides more detailed service and parts information for your unit. To obtain a Technical Manual, contact your local distributor. Your distributor can also supply you with Welding Process Manuals such as SMAW, GTAW, GMAW, and GMAW-P.*

Miller® *The Power of Blue.*

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## ⚠ WARNING

**This product, when used for welding or cutting, produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety Code Section 25249.5 et seq.)**

The following terms are used interchangeably throughout this manual:
TIG = GTAW
Stick = SMAW

# *Declaration of Conformity for European Community (CE) Products*

**Note** ☞ *This information is provided for units with CE certification (see rating label on unit).*

*Manufacturer's Name:* Miller Electric Mfg. Co.

*Manufacturer's Address:* 1635 W. Spencer Street
Appleton, WI 54914 USA

*Declares that the products:* **D-74S, D-74D**

*conform to the following Directives and Standards:*

**Directives**

Low Voltage Directive: 73/23/EEC

Electromagnetic Compatibility (EMC) Directive: 89/336/EEC

Machinery Directives: 89/392/EEC, 91/368/EEC, 93/C 133/04, 93/68/EEC

**Standards**

Arc Welding Equipment Part I: Welding Power Sources: IEC 60974-1
(September 1998 – Second Edition)

Arc Welding Equipment: Wirefeed Systems: IEC 974-5
(September 1997 – Draft Revision)

Degrees of Protection Provided By Enclosures (IP Code): IEC 529
(November 1989 – First Edition)

Insulation Coordination For Equipment With Low-Voltage Systems:
Part I: Principles, Requirements and Tests: IEC 664-1
(October 1992 – First Edition)

Electromagnetic Compatibility, (EMC): EN 50199
(August 1995)

*European Contact:* Mr. Danilo Fedolfi, Managing Director
MILLER Europe S.r.l.
Via Privata Iseo 6/E
20098 San Giuliano
Milanese, Italy

*Telephone:* 39(02)98290-1
*Fax:* 39(02)98290203

# SECTION 1 – SAFETY PRECAUTIONS - READ BEFORE USING

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## 1-1. Symbol Usage

Means Warning! Watch Out! There are possible hazards with this procedure! The possible hazards are shown in the adjoining symbols.

▲ **Marks a special safety message.**

☞ *Means "Note"; not safety related.*

This group of symbols means Warning! Watch Out! possible ELECTRIC SHOCK, MOVING PARTS, and HOT PARTS hazards. Consult symbols and related instructions below for necessary actions to avoid the hazards.

## 1-2. Arc Welding Hazards

▲ **The symbols shown below are used throughout this manual to call attention to and identify possible hazards. When you see the symbol, watch out, and follow the related instructions to avoid the hazard. The safety information given below is only a summary of the more complete safety information found in the Safety Standards listed in Section 1-4. Read and follow all Safety Standards.**

▲ **Only qualified persons should install, operate, maintain, and repair this unit.**

▲ **During operation, keep everybody, especially children, away.**

### ELECTRIC SHOCK can kill.

Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when power is on. In semiautomatic or automatic wire welding, the wire, wire reel, drive roll housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

- Do not touch live electrical parts.
- Wear dry, hole-free insulating gloves and body protection.
- Insulate yourself from work and ground using dry insulating mats or covers big enough to prevent any physical contact with the work or ground.
- Do not use AC output in damp areas, if movement is confined, or if there is a danger of falling.
- Use AC output ONLY if required for the welding process.
- If AC output is required, use remote output control if present on unit.
- Disconnect input power or stop engine before installing or servicing this equipment. Lockout/tagout input power according to OSHA 29 CFR 1910.147 (see Safety Standards).
- Properly install and ground this equipment according to its Owner's Manual and national, state, and local codes.
- Always verify the supply ground – check and be sure that input power cord ground wire is properly connected to ground terminal in disconnect box or that cord plug is connected to a properly grounded receptacle outlet.
- When making input connections, attach proper grounding conductor first – double-check connections.
- Frequently inspect input power cord for damage or bare wiring – replace cord immediately if damaged – bare wiring can kill.
- Turn off all equipment when not in use.
- Do not use worn, damaged, undersized, or poorly spliced cables.
- Do not drape cables over your body.
- If earth grounding of the workpiece is required, ground it directly with a separate cable.
- Do not touch electrode if you are in contact with the work, ground, or another electrode from a different machine.
- Use only well-maintained equipment. Repair or replace damaged parts at once. Maintain unit according to manual.
- Wear a safety harness if working above floor level.
- Keep all panels and covers securely in place.
- Clamp work cable with good metal-to-metal contact to workpiece or worktable as near the weld as practical.
- Insulate work clamp when not connected to workpiece to prevent contact with any metal object.
- Do not connect more than one electrode or work cable to any single weld output terminal.

### SIGNIFICANT DC VOLTAGE exists after removal of input power on inverters.

- Turn Off inverter, disconnect input power, and discharge input capacitors according to instructions in Maintenance Section before touching any parts.

### FUMES AND GASES can be hazardous.

Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

- Keep your head out of the fumes. Do not breathe the fumes.
- If inside, ventilate the area and/or use exhaust at the arc to remove welding fumes and gases.
- If ventilation is poor, use an approved air-supplied respirator.
- Read the Material Safety Data Sheets (MSDSs) and the manufacturer's instructions for metals, consumables, coatings, cleaners, and degreasers.
- Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Always have a trained watch-person nearby. Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Be sure the breathing air is safe.
- Do not weld in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapors to form highly toxic and irritating gases.
- Do not weld on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and if necessary, while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.

## ARC RAYS can burn eyes and skin.

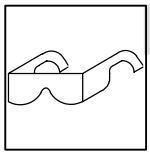
Arc rays from the welding process produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin. Sparks fly off from the weld.

- Wear a welding helmet fitted with a proper shade of filter to protect your face and eyes when welding or watching (see ANSI Z49.1 and Z87.1 listed in Safety Standards).
- Wear approved safety glasses with side shields under your helmet.
- Use protective screens or barriers to protect others from flash and glare; warn others not to watch the arc.
- Wear protective clothing made from durable, flame-resistant material (leather and wool) and foot protection.

## WELDING can cause fire or explosion.

Welding on closed containers, such as tanks, drums, or pipes, can cause them to blow up. Sparks can fly off from the welding arc. The flying sparks, hot workpiece, and hot equipment can cause fires and burns. Accidental contact of electrode to metal objects can cause sparks, explosion, overheating, or fire. Check and be sure the area is safe before doing any welding.

- Protect yourself and others from flying sparks and hot metal.
- Do not weld where flying sparks can strike flammable material.
- Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
- Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
- Watch for fire, and keep a fire extinguisher nearby.
- Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
- Do not weld on closed containers such as tanks, drums, or pipes, unless they are properly prepared according to AWS F4.1 (see Safety Standards).
- Connect work cable to the work as close to the welding area as practical to prevent welding current from traveling long, possibly unknown paths and causing electric shock and fire hazards.
- Do not use welder to thaw frozen pipes.
- Remove stick electrode from holder or cut off welding wire at contact tip when not in use.
- Wear oil-free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.
- Remove any combustibles, such as a butane lighter or matches, from your person before doing any welding.



## FLYING METAL can injure eyes.

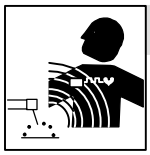
- Welding, chipping, wire brushing, and grinding cause sparks and flying metal. As welds cool, they can throw off slag.
- Wear approved safety glasses with side shields even under your welding helmet.

## BUILDUP OF GAS can injure or kill.

- Shut off shielding gas supply when not in use.
- Always ventilate confined spaces or use approved air-supplied respirator.

## HOT PARTS can cause severe burns.

- Do not touch hot parts bare handed.
- Allow cooling period before working on gun or torch.



## MAGNETIC FIELDS can affect pacemakers.

- Pacemaker wearers keep away.
- Wearers should consult their doctor before going near arc welding, gouging, or spot welding operations.

## NOISE can damage hearing.

Noise from some processes or equipment can damage hearing.

- Wear approved ear protection if noise level is high.

## CYLINDERS can explode if damaged.

Shielding gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding process, be sure to treat them carefully.

- Protect compressed gas cylinders from excessive heat, mechanical shocks, slag, open flames, sparks, and arcs.
- Install cylinders in an upright position by securing to a stationary support or cylinder rack to prevent falling or tipping.
- Keep cylinders away from any welding or other electrical circuits.
- Never drape a welding torch over a gas cylinder.
- Never allow a welding electrode to touch any cylinder.
- Never weld on a pressurized cylinder – explosion will result.
- Use only correct shielding gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition.
- Turn face away from valve outlet when opening cylinder valve.
- Keep protective cap in place over valve except when cylinder is in use or connected for use.
- Read and follow instructions on compressed gas cylinders, associated equipment, and CGA publication P-1 listed in Safety Standards.

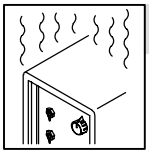
## 1-3. Additional Symbols For Installation, Operation, And Maintenance

### FIRE OR EXPLOSION hazard.

- Do not install or place unit on, over, or near combustible surfaces.
- Do not install unit near flammables.
- Do not overload building wiring – be sure power supply system is properly sized, rated, and protected to handle this unit.

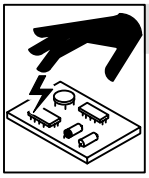
### FALLING UNIT can cause injury.

- Use lifting eye to lift unit only, NOT running gear, gas cylinders, or any other accessories.
- Use equipment of adequate capacity to lift and support unit.
- If using lift forks to move unit, be sure forks are long enough to extend beyond opposite side of unit.



### OVERUSE can cause OVERHEATING

- Allow cooling period; follow rated duty cycle.
- Reduce current or reduce duty cycle before starting to weld again.
- Do not block or filter airflow to unit.



### STATIC (ESD) can damage PC boards.

- Put on grounded wrist strap BEFORE handling boards or parts.
- Use proper static-proof bags and boxes to store, move, or ship PC boards.

### MOVING PARTS can cause injury.

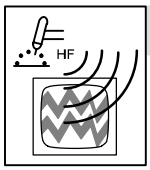
- Keep away from moving parts.
- Keep away from pinch points such as drive rolls.

### WELDING WIRE can cause injury.

- Do not press gun trigger until instructed to do so.
- Do not point gun toward any part of the body, other people, or any metal when threading welding wire.

### MOVING PARTS can cause injury.

- Keep away from moving parts such as fans.
- Keep all doors, panels, covers, and guards closed and securely in place.




### H.F. RADIATION can cause interference.

- High-frequency (H.F.) can interfere with radio navigation, safety services, computers, and communications equipment.
- Have only qualified persons familiar with electronic equipment perform this installation.
- The user is responsible for having a qualified electrician promptly correct any interference problem resulting from the installation.
- If notified by the FCC about interference, stop using the equipment at once.
- Have the installation regularly checked and maintained.
- Keep high-frequency source doors and panels tightly shut, keep spark gaps at correct setting, and use grounding and shielding to minimize the possibility of interference.

### ARC WELDING can cause interference.

- Electromagnetic energy can interfere with sensitive electronic equipment such as computers and computer-driven equipment such as robots.
- Be sure all equipment in the welding area is electromagnetically compatible.
- To reduce possible interference, keep weld cables as short as possible, close together, and down low, such as on the floor.
- Locate welding operation 100 meters from any sensitive electronic equipment.
- Be sure this welding machine is installed and grounded according to this manual.
- If interference still occurs, the user must take extra measures such as moving the welding machine, using shielded cables, using line filters, or shielding the work area.

## 1-4. Principal Safety Standards

*Safety in Welding and Cutting*, ANSI Standard Z49.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami FL 33126

*Safety and Health Standards*, OSHA 29 CFR 1910, from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

*Recommended Safe Practices for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances*, American Welding Society Standard AWS F4.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami, FL 33126

*National Electrical Code*, NFPA Standard 70, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

*Safe Handling of Compressed Gases in Cylinders*, CGA Pamphlet P-1, from Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.

*Code for Safety in Welding and Cutting*, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3.

*Safe Practices For Occupation And Educational Eye And Face Protection*, ANSI Standard Z87.1, from American National Standards Institute, 1430 Broadway, New York, NY 10018.

*Cutting And Welding Processes*, NFPA Standard 51B, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

## 1-5. EMF Information

Considerations About Welding And The Effects Of Low Frequency Electric And Magnetic Fields

Welding current, as it flows through welding cables, will cause electromagnetic fields. There has been and still is some concern about such fields. However, after examining more than 500 studies spanning 17 years of research, a special blue ribbon committee of the National Research Council concluded that: “The body of evidence, in the committee’s judgment, has not demonstrated that exposure to power-frequency electric and magnetic fields is a human-health hazard.” However, studies are still going forth and evidence continues to be examined. Until the final conclusions of the research are reached, you may wish to minimize your exposure to electromagnetic fields when welding or cutting.

To reduce magnetic fields in the workplace, use the following procedures:

1. Keep cables close together by twisting or taping them.
2. Arrange cables to one side and away from the operator.
3. Do not coil or drape cables around your body.
4. Keep welding power source and cables as far away from operator as practical.
5. Connect work clamp to workpiece as close to the weld as possible.

**About Pacemakers:**

Pacemaker wearers consult your doctor first. If cleared by your doctor, then following the above procedures is recommended.

# SECTION 1 – CONSIGNES DE SECURITE – LIRE AVANT UTILISATION



## 1-1. Signification des symboles

Signifie Mise en garde ! Soyez vigilant ! Cette procédure présente des risques de danger ! Ceux-ci sont identifiés par des symboles adjacents aux directives.

▲ **Identifie un message de sécurité particulier.**

☞ *Signifie NOTA ; n'est pas relatif à la sécurité.*

Ce groupe de symboles signifie Mise en garde ! Soyez vigilant ! Il y a des risques de danger reliés aux CHOCS ÉLECTRIQUES, aux PIÈCES EN MOUVEMENT et aux PIÈCES CHAUDES. Reportez-vous aux symboles et aux directives ci-dessous afin de connaître les mesures à prendre pour éviter tout danger.

## 1-2. Dangers relatifs au soudage à l'arc

▲ **Les symboles présentés ci-après sont utilisés tout au long du présent manuel pour attirer votre attention et identifier les risques de danger. Lorsque vous voyez un symbole, soyez vigilant et suivez les directives mentionnées afin d'éviter tout danger. Les consignes de sécurité présentées ci-après ne font que résumer l'information contenue dans les normes de sécurité énumérées à la section 1-4. Veuillez lire et respecter toutes ces normes de sécurité.**

▲ **L'installation, l'utilisation, l'entretien et les réparations ne doivent être confiés qu'à des personnes qualifiées.**

▲ **Au cours de l'utilisation, tenir toute personne à l'écart et plus particulièrement les enfants.**

### UN CHOC ÉLECTRIQUE peut tuer.

Un simple contact avec des pièces électriques peut provoquer une électrocution ou des blessures graves. L'électrode et le circuit de soudage sont sous tension dès que l'appareil est sur ON. Le circuit d'entrée et les circuits internes de l'appareil sont également sous tension à ce moment-là. En soudage semi-automatique ou automatique, le fil, le dévidoir, le logement des galets d'entraînement et les pièces métalliques en contact avec le fil de soudage sont sous tension. Des matériels mal installés ou mal mis à la terre présentent un danger.

- Ne jamais toucher les pièces électriques sous tension.
- Porter des gants et des vêtements de protection secs ne comportant pas de trous.
- S'isoler de la pièce et de la terre au moyen de tapis ou d'autres moyens isolants suffisamment grands pour empêcher le contact physique éventuel avec la pièce ou la terre.
- Ne pas se servir de source électrique àcourant électrique dans les zones humides, dans les endroits confinés ou là où on risque de tomber.
- Se servir d'une source électrique àcourant électrique UNIQUEMENT si le procédé de soudage le demande.
- Si l'utilisation d'une source électrique àcourant électrique s'avère nécessaire, se servir de la fonction de télécommande si l'appareil en est équipé.
- Couper l'alimentation ou arrêter le moteur avant de procéder à l'installation, à la réparation ou à l'entretien de l'appareil. Déverrouiller l'alimentation selon la norme OSHA 29 CFR 1910.147 (voir normes de sécurité).
- Installer et mettre à la terre correctement cet appareil conformément à son manuel d'utilisation et aux codes nationaux, provinciaux et municipaux.
- Toujours vérifier la terre du cordon d'alimentation – Vérifier et s'assurer que le fil de terre du cordon d'alimentation est bien raccordé à la borne de terre du sectionneur ou que la fiche du cordon est raccordée à une prise correctement mise à la terre.
- En effectuant les raccordements d'entrée fixer d'abord le conducteur de mise à la terre approprié et contre-vérifier les connexions.
- Vérifier fréquemment le cordon d'alimentation pour voir s'il n'est pas endommagé ou dénudé – remplacer le cordon immédiatement s'il est endommagé – un câble dénudé peut provoquer une électrocution.
- Mettre l'appareil hors tension quand on ne l'utilise pas.
- Ne pas utiliser des câbles usés, endommagés, de grosseur insuffisante ou mal épissés.
- Ne pas enrouler les câbles autour du corps.
- Si la pièce soudée doit être mise à la terre, le faire directement avec un câble distinct.
- Ne pas toucher l'électrode quand on est en contact avec la pièce, la terre ou une électrode provenant d'une autre machine.
- N'utiliser qu'un matériel en bon état. Réparer ou remplacer sur-le-champ les pièces endommagées. Entretenir l'appareil conformément à ce manuel.
- Porter un harnais de sécurité quand on travaille en hauteur.
- Maintenir solidement en place tous les panneaux et capots.
- Fixer le câble de retour de façon à obtenir un bon contact métal-métal avec la pièce à souder ou la table de travail, le plus près possible de la soudure.
- Isoler la pince de masse quand pas mis à la pièce pour éviter le contact avec tout objet métallique.

### Il y a DU COURANT CONTINU IMPORTANT dans les convertisseurs après la suppression de l'alimentation électrique.

- Arrêter les convertisseurs, débrancher le courant électrique, et décharger les condensateurs d'alimentation selon les instructions indiquées dans la partie entretien avant de toucher les pièces.

### LES FUMÉES ET LES GAZ peuvent être dangereux.

Le soudage génère des fumées et des gaz. Leur inhalation peut être dangereux pour votre santé.

- Eloigner votre tête des fumées. Ne pas respirer les fumées.
- A l'intérieur, ventiler la zone et/ou utiliser un échappement au niveau de l'arc pour l'évacuation des fumées et des gaz de soudage.
- Si la ventilation est insuffisante, utiliser un respirateur à alimentation d'air homologué.
- Lire les spécifications de sécurité des matériaux (MSDSs) et les instructions du fabricant concernant les métaux, les consommables, les revêtements, les nettoyants et les dégraisseurs.
- Travailler dans un espace fermé seulement s'il est bien ventilé ou en portant un respirateur à alimentation d'air. Demander toujours à un surveillant dûment formé de se tenir à proximité. Des fumées et des gaz de soudage peuvent déplacer l'air et abaisser le niveau d'oxygène provoquant des blessures ou des accidents mortels. S'assurer que l'air de respiration ne présente aucun danger.
- Ne pas souder dans des endroits situés à proximité d'opérations de dégraissage, de nettoyage ou de pulvérisation. La chaleur et les rayons de l'arc peuvent réagir en présence de vapeurs et former des gaz hautement toxiques et irritants.
- Ne pas souder des métaux munis d'un revêtement, tels que l'acier galvanisé, plaqué en plomb ou au cadmium à moins que le revêtement n'ait été enlevé dans la zone de soudure, que l'endroit soit bien ventilé, et si nécessaire, en portant un respirateur à alimentation d'air. Les revêtements et tous les métaux renfermant ces éléments peuvent dégager des fumées toxiques en cas de soudage.

## LES RAYONS DE L'ARC peuvent provoquer des brûlures dans les yeux et sur la peau.

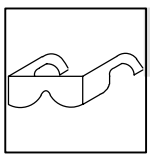
Le rayonnement de l'arc du procédé de soudage génère des rayons visibles et invisibles intenses (ultraviolets et infrarouges) susceptibles de provoquer des brûlures dans les yeux et sur la peau. Des étincelles sont projetées pendant le soudage.

- Porter un casque de soudage muni d'un écran de filtre approprié pour protéger votre visage et vos yeux pendant le soudage ou pour regarder (voir ANSI Z49.1 et Z87.1 énuméré dans les normes de sécurité).
- Porter des protections approuvés pour les oreilles si le niveau sondre est trop élevé.
- Utiliser des écrans ou des barrières pour protéger des tiers de l'éclair et de l'éblouissement; demander aux autres personnes de ne pas regarder l'arc.
- Porter des vêtements de protection constitué dans une matière durable, résistant au feu (cuir ou laine) et une protection des pieds.

## LE SOUDAGE peut provoquer un incendie ou une explosion.

Le soudage effectué sur des conteneurs fermés tels que des réservoirs, tambours ou des conduites peut provoquer leur éclatement. Des étincelles peuvent être projetées de l'arc de soudure. La projection d'étincelles, des pièces chaudes et des équipements chauds peut provoquer des incendies et des brûlures. Le contact accidentel de l'électrode avec des objets métalliques peut provoquer des étincelles, une explosion, un surchauffement ou un incendie. Avant de commencer le soudage, vérifier et s'assurer que l'endroit ne présente pas de danger.

- Se protéger et d'autres personnes de la projection d'étincelles et de métal chaud.
- Ne pas souder dans un endroit là où des étincelles peuvent tomber sur des substances inflammables.
- Déplacer toutes les substances inflammables à une distance de 10,7 m de l'arc de soudage. En cas d'impossibilité les recouvrir soigneusement avec des protections homologués.
- Des étincelles et des matériaux chauds du soudage peuvent facilement passer dans d'autres zones en traversant de petites fissures et des ouvertures.
- Surveiller tout déclenchement d'incendie et tenir un extincteur à proximité.
- Le soudage effectué sur un plafond, plancher, paroi ou séparation peut déclencher un incendie de l'autre côté.
- Ne pas effectuer le soudage sur des conteneurs fermés tels que des réservoirs, tambours, ou conduites, à moins qu'ils n'aient été préparés correctement conformément à AWS F4.1 (voir les normes de sécurité).
- Brancher le câble sur la pièce le plus près possible de la zone de soudage pour éviter le transport du courant sur une longue distance par des chemins inconnus éventuels en provoquant des risques d'électrocution et d'incendie.
- Ne pas utiliser le poste de soudage pour dégeler des conduites gelées.
- En cas de non utilisation, enlever la baguette d'électrode du porte-électrode ou couper le fil à la pointe de contact.
- Porter des vêtements de protection dépourvus d'huile tels que des gants en cuir, une chemise en matériau lourd, des pantalons sans revers, des chaussures hautes et un couvre chef.
- Avant de souder, retirer toute substance combustible de vos poches telles qu'un allumeur au butane ou des allumettes.



## DES PARTICULES VOLANTES peuvent blesser les yeux.

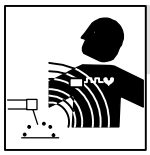
- Le soudage, l'écaillement, le passage de la pièce à la brosse en fil de fer, et le meulage génèrent des étincelles et des particules métalliques volantes. Pendant la période de refroidissement des soudures, elles risquent de projeter du laitier.
- Porter des lunettes de sécurité avec écrans latéraux ou un écran facial.

## LES ACCUMULATIONS DE GAZ risquent de provoquer des blessures ou même la mort.

- Fermer l'alimentation du gaz protecteur en cas de non utilisation.
- Veiller toujours à bien aérer les espaces confinés ou se servir d'un respirateur d'adduction d'air homologué.

## DES PIÈCES CHAUDES peuvent provoquer des brûlures graves.

- Ne pas toucher des parties chaudes à mains nues
- Prévoir une période de refroidissement avant d'utiliser le pistolet ou la torche.



## LES CHAMPS MAGNÉTIQUES peuvent affecter les stimulateurs cardiaques.

- Porteurs de stimulateur cardiaque, restez à distance.
- Les porteurs d'un stimulateur cardiaque doivent d'abord consulter leur médecin avant de s'approcher des opérations de soudage à l'arc, de gougeage ou de soudage par points.

## LE BRUIT peut affecter l'ouïe.

Le bruit des processus et des équipements peut affecter l'ouïe.

- Porter des protections approuvés pour les oreilles si le niveau sondre est trop élevé.

## Si des BOUTEILLES sont endommagées, elles pourront exploser.

Des bouteilles de gaz protecteur contiennent du gaz sous haute pression. Si une bouteille est endommagée, elle peut exploser. Du fait que les bouteilles de gaz font normalement partie du procédé de soudage, les manipuler avec précaution.

- Protéger les bouteilles de gaz comprimé d'une chaleur excessive, des chocs mécaniques, du laitier, des flammes ouvertes, des étincelles et des arcs.
- Placer les bouteilles debout en les fixant dans un support stationnaire ou dans un porte-bouteilles pour les empêcher de tomber ou de se renverser.
- Tenir les bouteilles éloignées des circuits de soudage ou autres circuits électriques.
- Ne jamais placer une torche de soudage sur une bouteille à gaz.
- Une électrode de soudage ne doit jamais entrer en contact avec une bouteille.
- Ne jamais souder une bouteille pressurisée – risque d'explosion.
- Utiliser seulement des bouteilles de gaz protecteur, régulateurs, tuyaux et raccords convenables pour cette application spécifique; les maintenir ainsi que les éléments associés en bon état.
- Ne pas tenir la tête en face de la sortie en ouvrant la soupape de la bouteille.
- Maintenir le chapeau de protection sur la soupape, sauf en cas d'utilisation ou de branchement de la bouteille.
- Lire et suivre les instructions concernant les bouteilles de gaz comprimé, les équipements associés et les publications P-1 CGA énumérées dans les normes de sécurité.

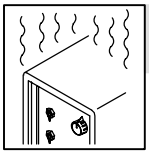
## 1-3. Dangers supplémentaires en relation avec l'installation, le fonctionnement et la maintenance

### Risque D'INCENDIE OU D'EXPLOSION.

- Ne pas placer l'appareil sur, au-dessus ou à proximité de surfaces infllammables.
- Ne pas installer l'appareil à proximité de produits inflammables
- Ne pas surcharger l'installation électrique – s"assurer que l'alimentation est correctement dimensionné et protégé avant de mettre l'appareil en service.

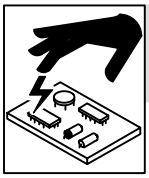
### LA CHUTE DE L'APPAREIL peut blesser.

- Utiliser l'anneau de levage uniquement pour soulever l'appareil, NON PAS les chariot, les bouteilles de gaz ou tout autre accessoire.
- Utiliser un engin d'une capacité appropriée pour soulever l'appareil.
- En utilisant des fourches de levage pour déplacer l'unité, s'assurer que les fourches sont suffisamment longues pour dépasser du côté opposé de l'appareil.



### L'EMPLOI EXCESSIF peut SURCHAUFFER L'ÉQUIPEMENT.

- Prévoir une période de refroidissement, respecter le cycle opératoire nominal.
- Réduire le courant ou le cycle opératoire avant de recommancer le soudage.
- Ne pas obstruer les passages d'air du poste.



### LES CHARGES ÉLECTROSTATIQUES peuvent endommager les circuits imprimés.

- Établir la connexion avec la barrette de terre avant de manipuler des cartes ou des pièces.
- Utiliser des pochettes et des boîtes antistatiques pour stocker, déplacer ou expédier des cartes de circuits imprimes.

### DES ORGANES MOBILES peuvent provoquer des blessures.

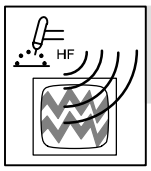
- Ne pas s'approcher des organes mobiles.
- Ne pas s'approcher des points de coincement tels que des rouleaux de commande.

### LES FILS DE SOUDAGE peuvent provoquer des blessures.

- Ne pas appuyer sur la gachette avant d'en avoir reçu l'instruction.
- Ne pas diriger le pistolet vers soi, d'autres personnes ou toute pièce mécanique en engageant le fil de soudage.

### DES ORGANES MOBILES peuvent provoquer des blessures.

- Rester à l'écart des organes mobiles comme le ventilateur.
- Maintenir fermés et fixement en place les portes, panneaux, recouvrements et dispositifs de protection.




### LE RAYONNEMENT HAUTE FRÉQUENCE (H.F.) risque de provoquer des interférences.

- Le rayonnement haute frequence peut provoquer des interférences avec les équipements de radio–navigation et de communication, les services de sécurité et les ordinateurs.
- Demander seulement à des personnes qualifiées familiarisées avec des équipements électroniques de faire fonctionner l'installation.
- L'utilisateur est tenu de faire corriger rapidement par un électricien qualifié les interférences résultant de l'installation.
- Si le FCC signale des interférences, arrêter immédiatement l'appareil.
- Effectuer régulièrement le contrôle et l'entretien de l'installation.
- Maintenir soigneusement fermés les portes et les panneaux des sources de haute fréquence, maintenir les éclateurs à une distance correcte et utiliser une terre et et un blindage pour réduire les interférences éventuelles.

### LE SOUDAGE À L'ARC risque de provoquer des interférences.

- L'énergie électromagnétique risque de provoquer des interférences pour l'équipement électronique sensible tel que les ordinateurs et l'équipement commandé par ordinateur tel que les robots.
- Veiller à ce que tout l'équipement de la zone de soudage soit compatible électromagnétiquement.
- Pour réduire la possibilité d'interférence, maintenir les câbles de soudage aussi courts que possible, les grouper, et les poser aussi bas que possible (ex. par terre).
- Veiller à souder à une distance de 100 mètres de tout équipement électronique sensible.
- Veiller à ce que ce poste de soudage soit posé et mis à la terre conformément à ce mode d'emploi.
- En cas d'interférences après avoir pris les mesures précédentes, il incombe à l'utilisateur de prendre des mesures supplémentaires telles que le déplacement du poste, l'utilisation de câbles blindés, l'utilisation de filtres de ligne ou la pose de protecteurs dans la zone de travail.

### LES CHAMPS MAGNÉTIQUES peuvent affecter les stimulateurs cardiaques.

- Porteurs de stimulateur cardiaque, restez à distance.
- Les porteurs d'un stimulateur cardiaque doivent d'abord consulter leur médecin avant de s'approcher des opérations de soudage à l'arc, de gougeage ou de soudage par points.

## 1-4. Principales normes de sécurité

*Safety in Welding and Cutting,* norme ANSI Z49.1, de l'American Welding Society, 550 N.W. Lejeune Rd, Miami FL 33126

*Safety and Health Sandards,* OSHA 29 CFR 1910, du Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

*Recommended Safe Practice for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances,* norme AWS F4.1, de l'American Welding Society, 550 N.W. Lejeune Rd, Miami FL 33126

*National Electrical Code,* NFPA Standard 70, de la National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

*Safe Handling of Compressed Gases in Cylinders,* CGA Pamphlet P-1, de la Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.

*Règles de sécurité en soudage, coupage et procédés connexes,* norme CSA W117.2, de l'Association canadienne de normalisation, vente de normes, 178 Rexdale Boulevard, Rexdale (Ontario) Canada M9W 1R3.

*Safe Practices For Occupation And Educational Eye And Face Protection*, norme ANSI Z87.1, de l'American National Standards Institute, 1430 Broadway, New York, NY 10018.

*Cutting and Welding Processes,* norme NFPA 51B, de la National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

## 1-5. Information sur les champs électromagnétiques

Données sur le soudage électrique et sur les effets, pour l'organisme, des champs magnétiques basse fréquence

Le courant de soudage, pendant son passage dans les câbles de soudage, causera des champs électromagnétiques. Il y a eu et il y a encore un certain souci à propos de tels champs. Cependant, après avoir examiné plus de 500 études qui ont été faites pendant une période de recherche de 17 ans, un comité spécial ruban bleu du National Research Council a conclu: "L'accumulation de preuves, suivant le jugement du comité, n'a pas démontré que l'exposition aux champs magnétiques et champs électriques à haute fréquence représente un risque à la santé humaine". Toutefois, des études sont toujours en cours et les preuves continuent à être examinées. En attendant que les conclusions finales de la recherche soient établies, il vous serait souhaitable de réduire votre exposition aux champs électromagnétiques pendant le soudage ou le coupage.

Afin de réduire les champs électromagnétiques dans l'environnement de travail, respecter les consignes suivantes :

1 Garder les câbles ensembles en les torsadant ou en les attachant avec du ruban adhésif.

2 Mettre tous les câbles du côté opposé de l'opérateur.

3 Ne pas courber pas et ne pas entourer pas les câbles autour de votre corps.

4 Garder le poste de soudage et les câbles le plus loin possible de vous.

5 Relier la pince de masse le plus près possible de la zone de soudure.

**Consignes relatives aux stimulateurs cardiaques :**

Les personnes qui portent un stimulateur cardiaque doivent avant tout consulter leur docteur. Si vous êtes déclaré apte par votre docteur, il est alors recommandé de respecter les consignes ci–dessus.

# SECTION 2 – DEFINITIONS

## 2-1. Warning Label Definitions

A. Warning! Watch Out! There are possible hazards as shown by the symbols.

B. Drive rolls can injure fingers.

C. Welding wire and drive parts are at welding voltage during operation – keep hands and metal objects clear.

1 Electric shock can kill.

1.1 Wear dry insulating gloves. Do not touch electrode with bare hand. Do not wear wet or damaged gloves.

1.2 Protect yourself from electric shock by insulating yourself from work and ground.

1.3 Disconnect input plug or power before working on machine.

2 Breathing welding fumes can be hazardous to your health.

2.1 Keep your head out of the fumes.

2.2 Use forced ventilation or local exhaust to remove the fumes.

2.3 Use ventilating fan to remove fumes.

3 Welding sparks can cause explosion or fire.

3.1 Keep flammables away from welding. Don't weld near flammables.

3.2 Welding sparks can cause fires. Have a fire extinguisher nearby and have a watch person ready to use it.

3.3 Do not weld on drums or any closed containers.

4 Arc rays can burn eyes and injure skin.

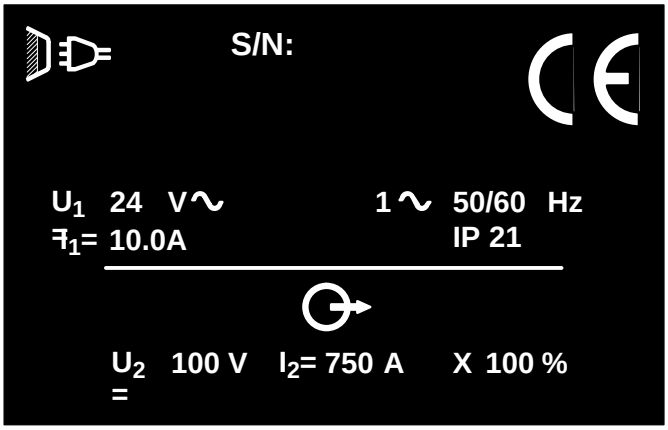
4.1 Wear hat and safety glasses. Use ear protection and button shirt collar. Use welding helmet with correct shade of filter. Wear complete body protection.

5 Become trained and read the instructions before working on the machine or welding.

6 Do not remove or paint over (cover) the label.

## 2-2. Rating Label For CE Products

*For label location see Section 4-3.*




ST-178 794-A

## 2-3. Symbols And Definitions

**Note** *Some symbols are found only on CE products.*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| A | Amperes | V | Volts | | Alternating Current | X | Duty Cycle |
| IP | Degree Of Protection | Hz | Hertz | | Program | | Wire Feed |
| | Jog | | Output | | Trigger | | Line Connection |
| | Set Up | | Sequence | | Trigger Hold On | | Trigger Hold Off |
| | Purge | | Press To Set | | Start | | Crater |
| t | Time | t1 | Preflow Time | t2 | Postflow Time | | Read Instructions |
| | Increase | $I_1$ | Primary Current | $I_2$ | Rated Current | $U_2$ | Load Voltage |
| $U_1$ | Primary Voltage | A B | Dual Schedule | | | | |

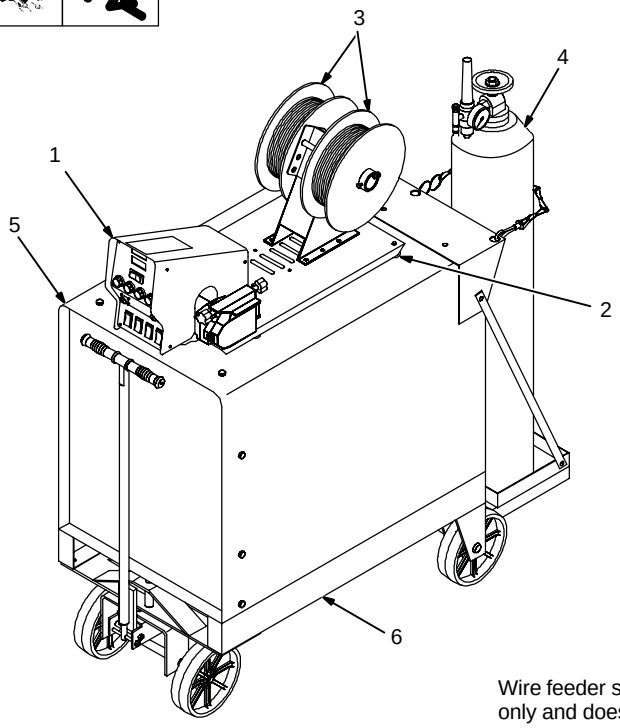
# SECTION 3 – INTRODUCTION

## 3-1. Specifications

| Type of Input Power | Welding Power Source Type | Wire Feed Speed Range | Wire Diameter Range | Welding Circuit Rating | IP Rating | Overall Dimensions | Weight |
|---|---|---|---|---|---|---|---|
| 24 Volts AC Single-Phase 10 Amperes 50/60 Hertz | Constant Voltage (CV) DC With 14-Pin And Contactor Control | Standard: 50 To 780 ipm (1.3 To 19.8 mpm)<br>Optional High Speed: 90 To 1440 ipm (2.3 To 36.6 mpm) | .023 To 1/8 in (0.6 To 3.2 mm)<br>Max Spool Weight: 60 lb (27 kg) | 100 Volts, 750 Amperes, 100% Duty Cycle | IP 21 | Length: 35 in (889 mm)<br>Width: 12-1/2 in (318 mm)<br>Height: 14 in (356 mm) | 87 lb (39.5 kg) |

# SECTION 4 – INSTALLATION

## 4-1. Site Selection




▲ **Do not put feeder where welding wire hits cylinder.**

▲ **Do not move or operate equipment when it could tip.**

1 Wire Feeder

2 Rubber Feet

Choose slot that allows all rubber feet to sit securely on top of welding power source.

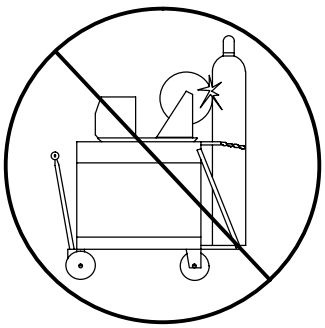
3 Wire Spool/Reels

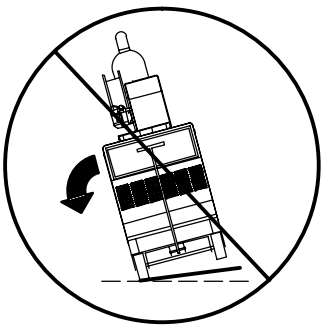
4 Gas Cylinder w/Hose And Regulator (Customer Supplied)

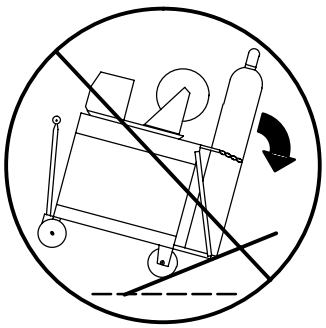
5 Welding Power Source

6 Running Gear

Wire feeder shown is representative only and does not reflect actual unit.



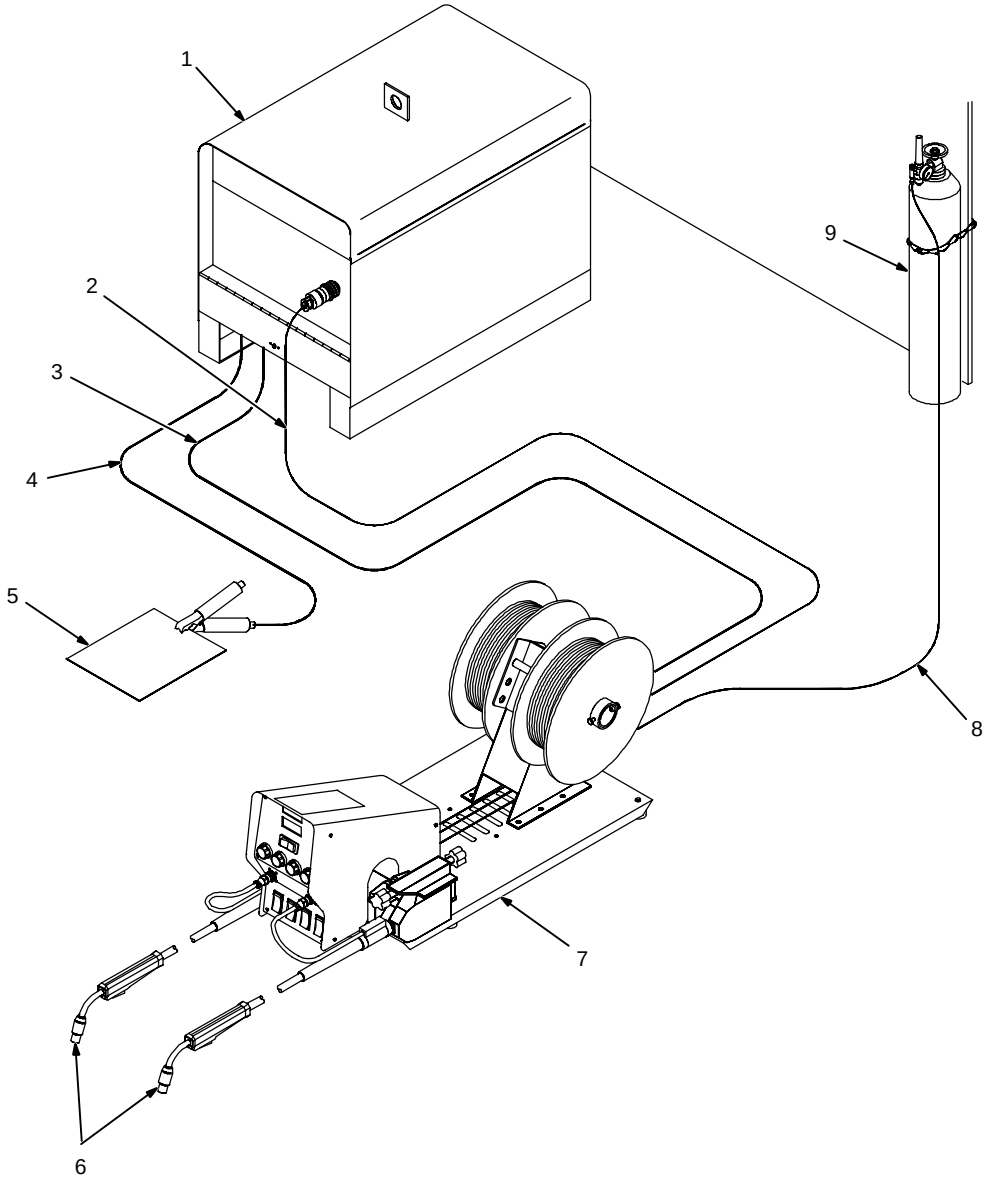




Ref. 803 048

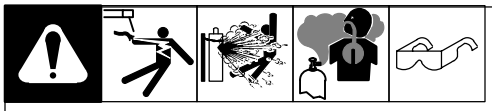
## 4-2. Equipment Connection Diagrams

1 Welding Power Source
2 Contactor Control/Power Cord
3 Positive (+) Weld Cable
4 Negative (–) Weld Cable
5 Workpiece
6 Welding Gun
7 Wire Feeder
8 Gas Hose
9 Gas Cylinder




803 068

## 4-3. Rear Panel Connections And Rotating Drive Assembly



1 14-Pin Control Cable - 10 Ft

2 Shielding Gas Valve Fittings

Requires fitting with 5/8-18 right-hand threads. Connect customer-supplied gas hose.

3 Weld Cable Terminal

4 Jumper Weld Cable

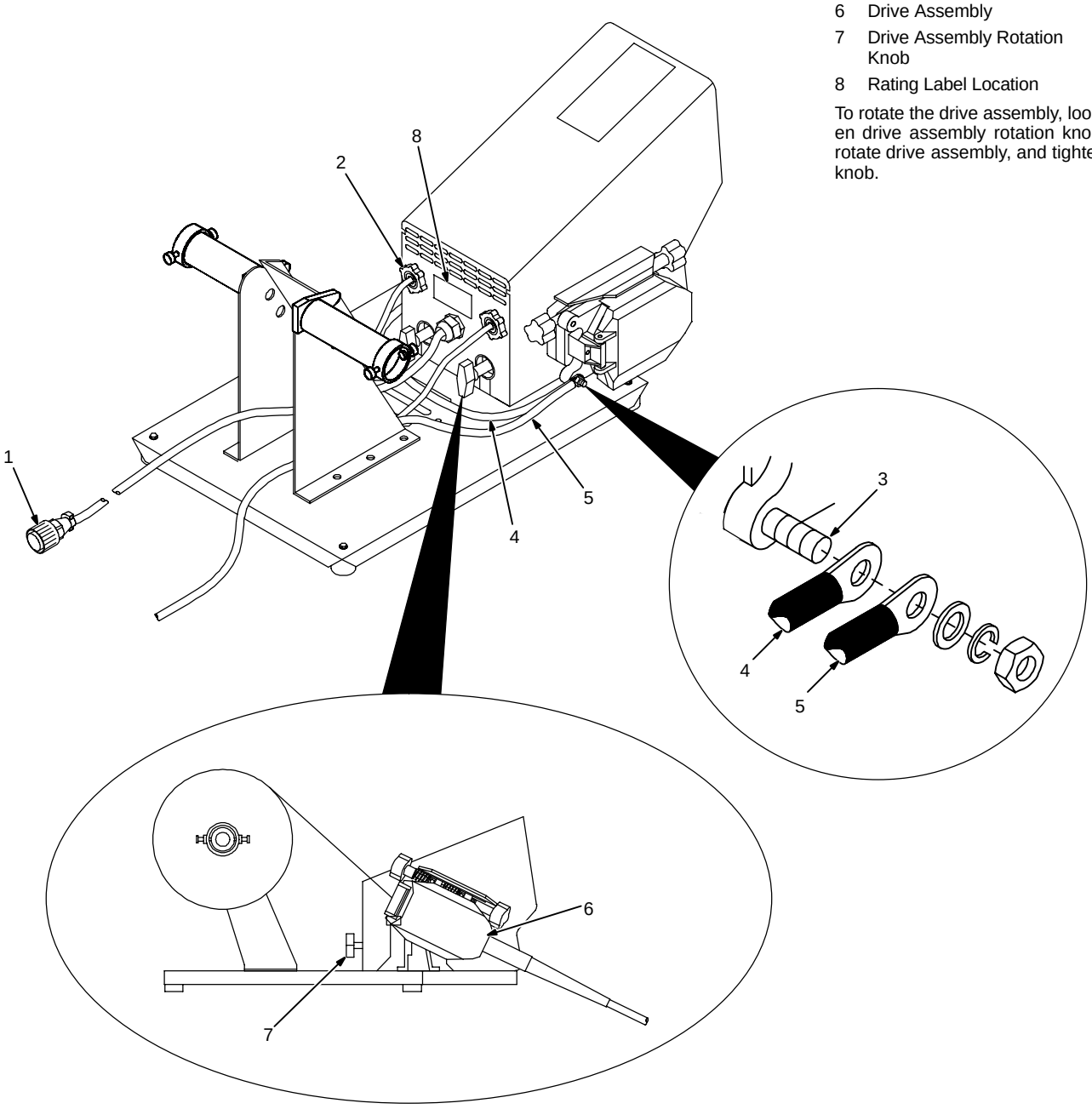
5 Weld Cable

6 Drive Assembly

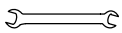
7 Drive Assembly Rotation Knob

8 Rating Label Location

To rotate the drive assembly, loosen drive assembly rotation knob, rotate drive assembly, and tighten knob.




Tools Needed:

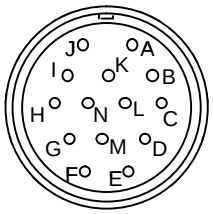


9/16, 5/8 in

3/16 in

803 067 / 802 825-A

## 4-4. 14-Pin Plug Information

| REMOTE 14 | Pin* | Pin Information |
|---|---|---|
|  | A | 24 volts ac with respect to socket G. |
| | B | Contact closure to A completes 24 volts ac contactor control circuit. |
| | G | Circuit common for 24 volts AC circuit. |
| | C | +10 volts dc input from power source to wire feeder with respect to socket D. |
| | D | Remote control circuit common. |
| | E | 0 to +10 volts dc output signal from wire feeder to power source with respect to socket D. |
| | H | Voltage feedback; 0 to +10 volts dc, 1 volt per 10 arc volts. |
| | F | Current feedback; 0 to +10 volts dc, 1 volt per 100 amperes. |
| *The remaining pins are not used. | | |

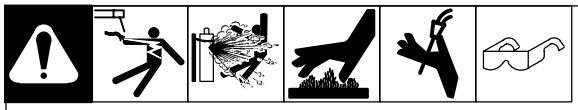
## 4-5. Gun Recommendation Table

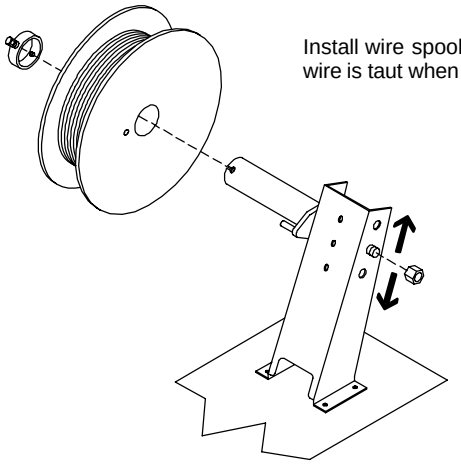
| Process | Gun |
|---|---|
| GMAW – Hard or Cored Wires | Roughneck C-Series Guns: 300, 400, 500, And 600 Amp. |
| FCAW – Self-Shielding Wires | FC-1260 Or FC-1150 |

## 4-6. Wire Type, Size, And Feed Speed Capability Table

| Motor Speed | Wire Type | Wire Size | Feed Speed Capability |
|---|---|---|---|
| Standard | All | .023 To 5/64 in (0.6 To 2 mm) | 50 To 780 ipm (1.2 To 19.8 mpm) |
| Standard | All | 3/32 To 7/64 in (2.4 To 2.8 mm) | 50 To 700 ipm (1.2 To 17.8 mpm) |
| Standard | All | 1/8 in (3.2 mm) | 50 To 300 ipm (1.2 To 7.6 mpm) |
| Optional High Speed | All | .023 To 5/64 in (0.6 To 2 mm) | 90 To 1440 ipm (2.2 To 36.5 mpm) |

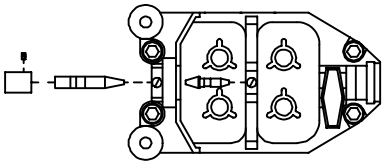
## 4-7. Installing And Threading Welding Wire



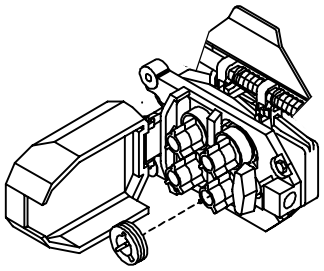


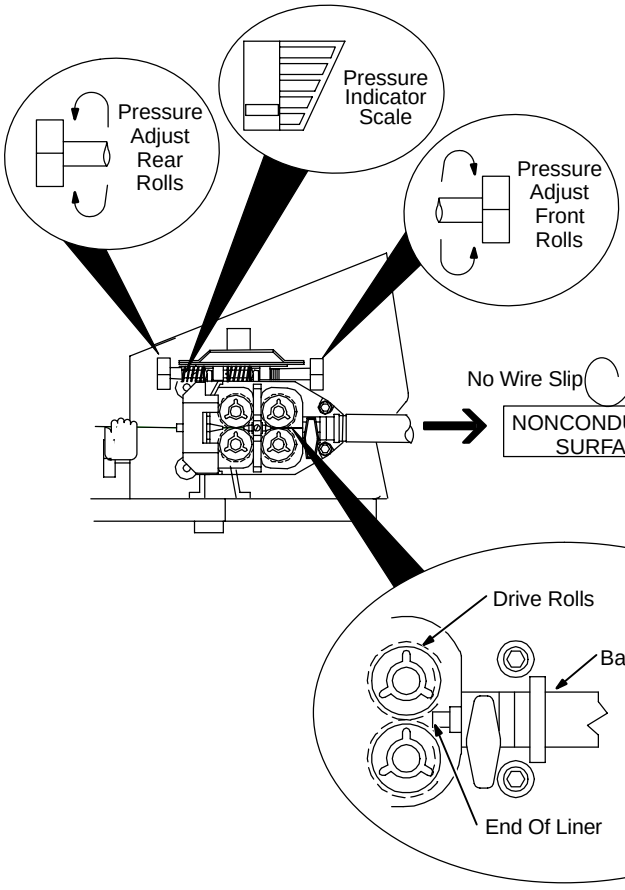
Install wire spool. Adjust tension nut so wire is taut when wire feed stops.

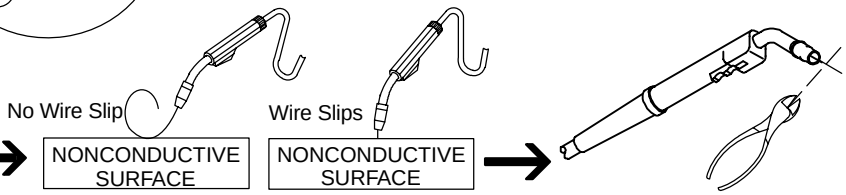
Install wire guides and anti-wear guide.

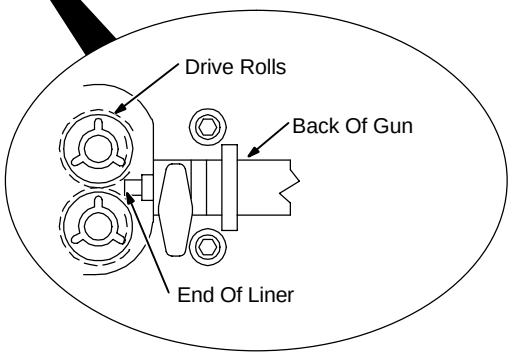


Install drive rolls.

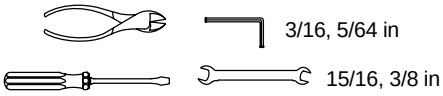





Tools Needed:




☞ *For best wire feeding performance, be sure that the outlet cable has the proper size liner for the welding wire size being used. Also, when the gun is installed, the liner extending from the back of the gun should be as close to the drive rolls as possible, without touching.*

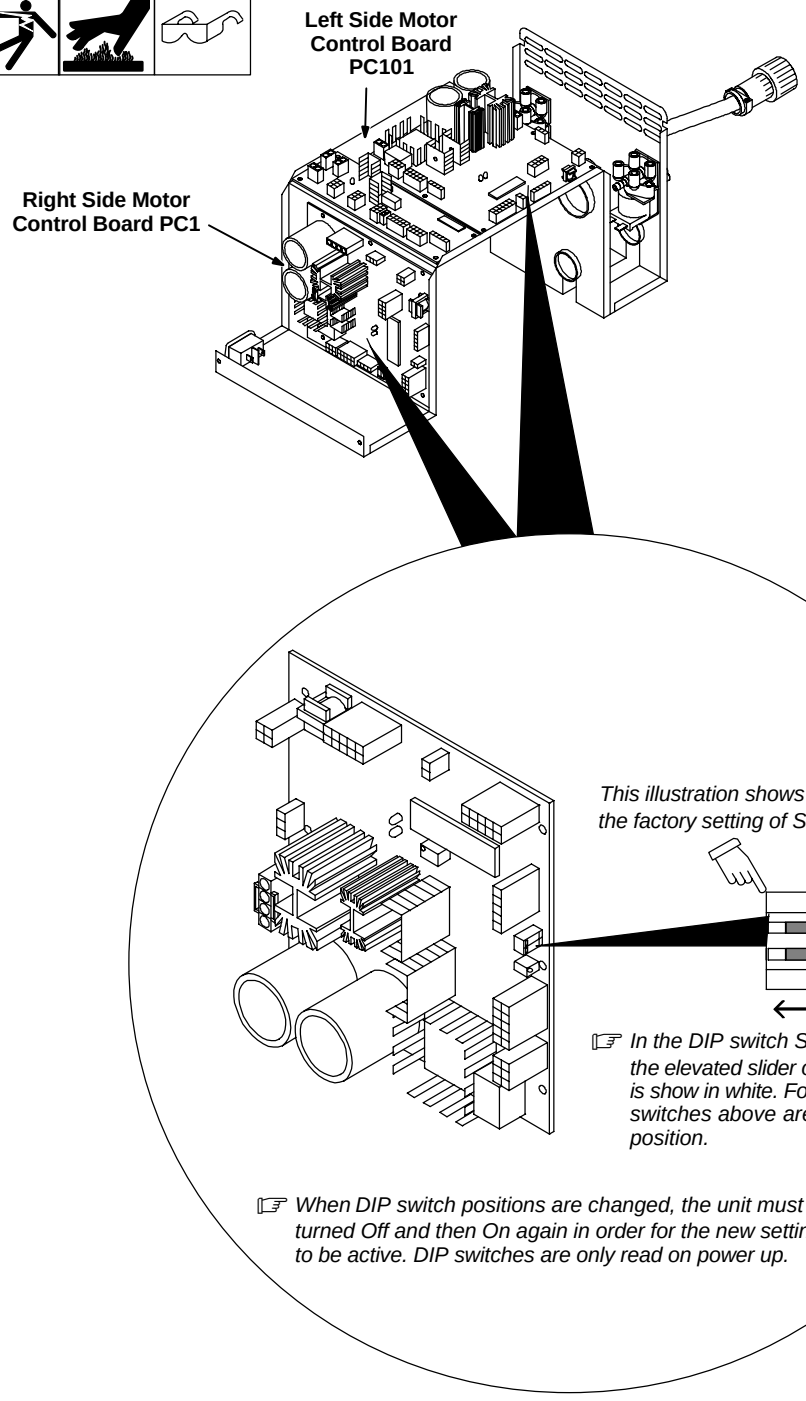
Install gun. Lay gun cable out straight. Cut off end of wire. Push wire through guides up to drive rolls; continue to hold wire. Press Jog button to feed wire out gun.

☞ *For soft wire or small diameter stainless steel wire, reduce drive roll pressure on the rear roll to half that of the front rolls.*

☞ To adjust drive roll pressure, hold nozzle about 2 in (51 mm) from nonconductive surface and press gun trigger to feed wire against surface. Tighten knob so wire does not slip. Do not overtighten. If contact tip is completely blocked, wire should slip at the feeder (see pressure adjustment above).Cut wire off. Close cover.

Ref. 156 929-A / Ref. 150 922 / Ref. 156 930 / S-0627-A

## 4-8. Setting Internal DIP Switches




Remove wrapper.

1 DIP Switch S1 On Motor Boards PC1 And PC101

- **Setting Current Detect Override (S1-1)**

Current detect override is used to disable automatic run-in when a welding power source is used that doesn't provide current feedback through the 14-pin receptacle.

☞ *Pins F & H are not present in 14 pin receptacle on this machine.*

Install wrapper when finished.

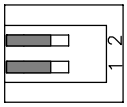



☞ *In the DIP switch S1 illustrations, the elevated slider on each switch is show in white. For example, the switches above are all in the Off position.*

☞ *When DIP switch positions are changed, the unit must be turned Off and then On again in order for the new settings to be active. DIP switches are only read on power up.*

**Position Settings And Results For DIP Switch S1 On PC1 And PC101**

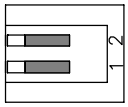
**Current Detect Override**




**S1-1 And S1-2**

On = Current detect override. For welding power sources that don't provide current feedback through the 14-pin receptacle. Factory set automatic run-in is inactive.

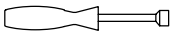
**Factory Default**




**S1-1 And S1-2**

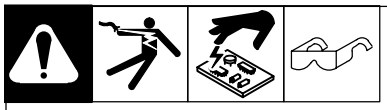
Off = Current must be detected from power sources that provide current feedback through the 14-pin receptacle to go from automatic run-in to welding condition. Factory-set automatic run-in wire speed is active.

Tools Needed:




803 063 / Ref. 802 944

## 4-9. Optional Equipment DIP Switch Settings

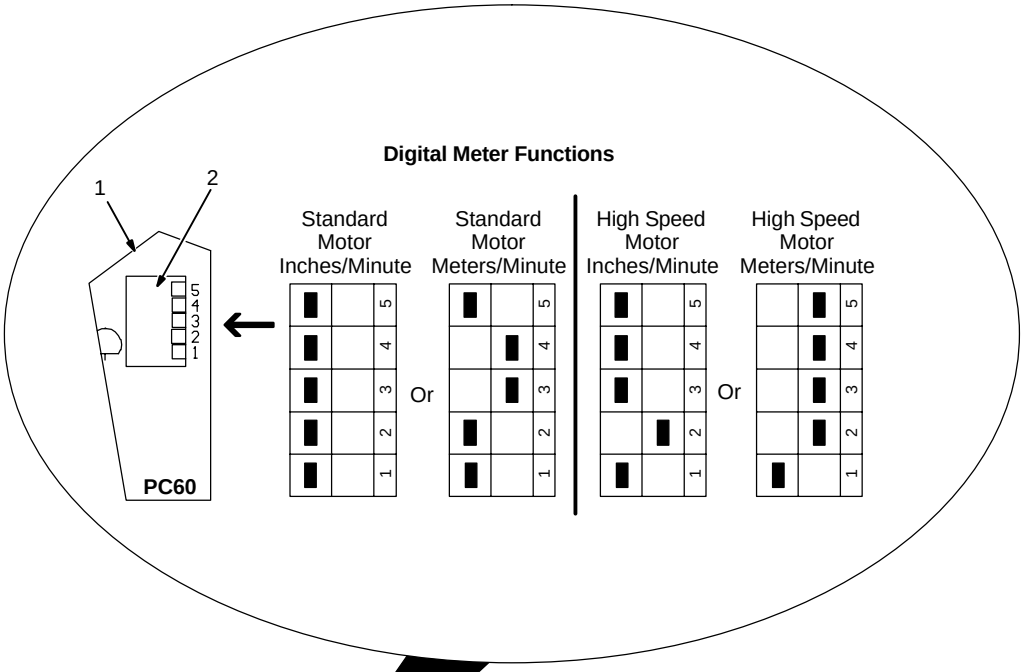


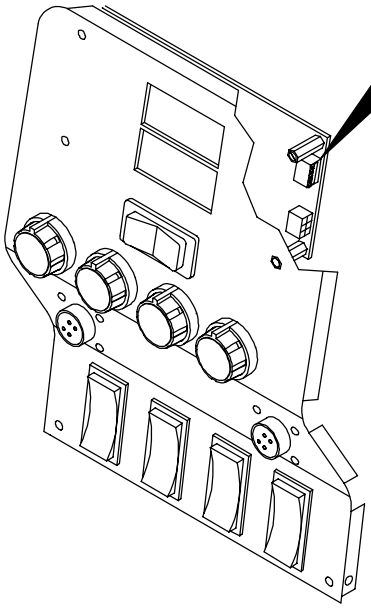
Remove wrapper.

1 Digital Meter Board PC60

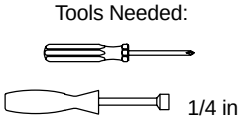
2 Meter Board Switch S2

Install wrapper when finished.



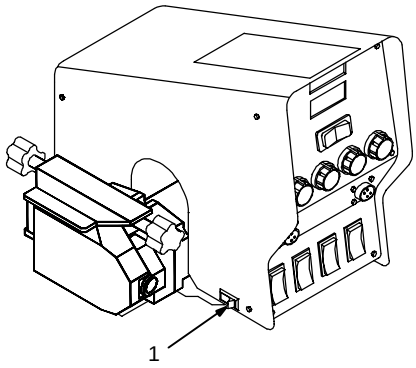
Tools Needed:




803 069

# SECTION 5 – OPERATION

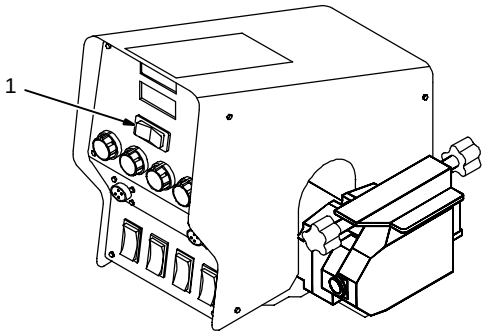
## 5-1. Power Switch




1 Power Switch

Ref. 803 065

## 5-2. Left/Right Select Switch

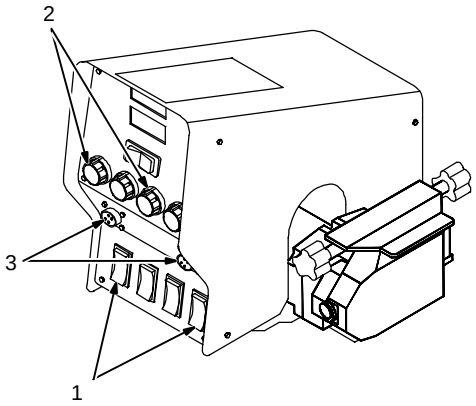



1 Left/Right Select Switch

Pressing the Left/Right Select switch allows the operator to choose which side of the unit's controls will operate.

Ref. 803 048

## 5-3. Jog/Purge



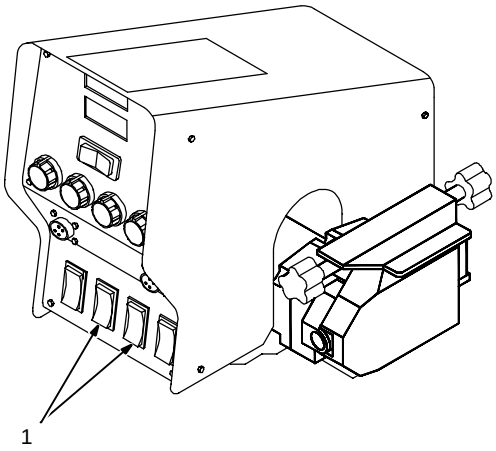

1 Jog/Purge Push Buttons
2 Wire Speed Controls
3 Gun Trigger Receptacles

Ref. 803 048

Pressing the Jog/Purge switch allows the operator to jog wire without energizing the weld power or gas valve circuit.

- The unit also provides the ability to jog the wire feeder by means of the gun trigger, however, the contactor is energized for 3 seconds.
- If the welding arc does not initiate in 3 seconds after the gun trigger is activated, the unit will perform a jog operation for a maximum of two minutes. If the gun trigger is still activated after two minutes, the jog operation is terminated to prevent complete despooling of the wire, as in the case of a damaged gun.
- Despooling protection is not available if current detect override is enabled (when DIP switch S1-1 on motor board PC1 or PC101 is in On position as shown in Section 4-8).
- Jog speed can be adjusted with the Wire Speed control when the unit is jogging wire. If equipped with meters, the unit displays jog speed while the unit is being jogged.
- Pressing the Jog/Purge button also allows the operator to purge gas lines before welding and to preset gas pressure at the regulator.

## 5-4. Trigger Hold Switch



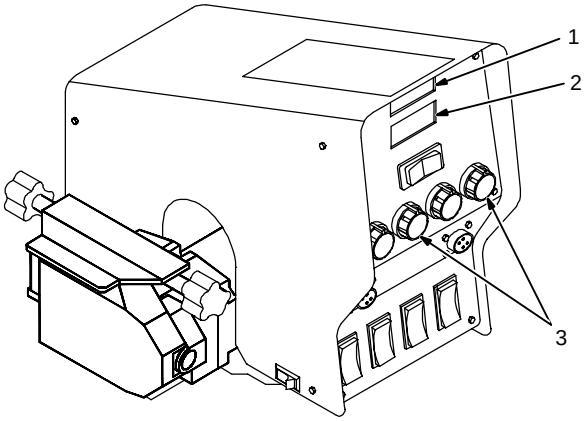

1 Trigger Hold Switches

Trigger hold allows the operator to weld without holding the gun trigger.

- To use the trigger hold function, place the trigger hold switch in the On position.
- The operator must hold the trigger for a minimum of 2 seconds, but not longer than 6 seconds before releasing it. Welding will continue when the trigger is released.
- To stop welding, press the trigger again.

Ref. 803 048

## 5-5. Voltage Control And Digital Meters




1 Voltmeter

Displays actual or preset voltage from welding power source through the 14–pin control cable.

2 Wire Speed Meter

Displays preset and actual wire feed speed while welding.

Factory set to display inches per minute. If display of meters per minute is desired, see Section 4-9.

3 Voltage Controls

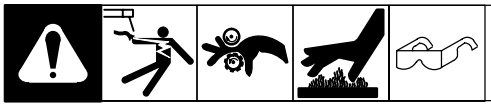
Use controls to adjust voltage output of welding power source.

☞ *You can adjust the preset voltage display on the wire feeder to match your power source's display by adjusting P2 on motor control board PC101 (left side), and/or P2 on motor control board PC1 (right side). See Section 6-2 for location of P2.*

Ref. 803 065

# SECTION 6 – MAINTENANCE

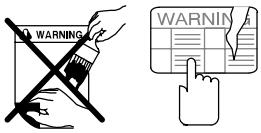
## 6-1. Routine Maintenance



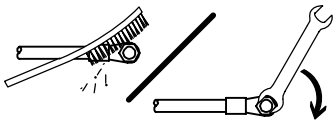
▲ **Disconnect power before maintaining.**

### 3 Months

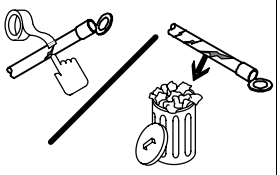
Replace unreadable labels.



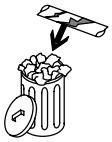

Clean and tighten weld terminals.



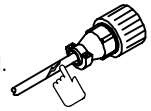
Repair or replace cracked weld cable.



Replace cracked parts.

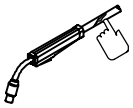


Check 14-pin cord.



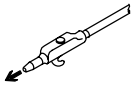
Check gas hose and fittings.

Check gun cable.

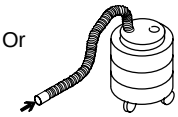


### 6 Months

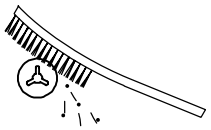
Blow out or vacuum inside. During heavy service, clean monthly.



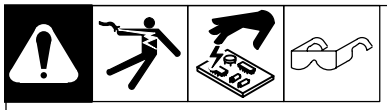
Or



Clean drive rolls.



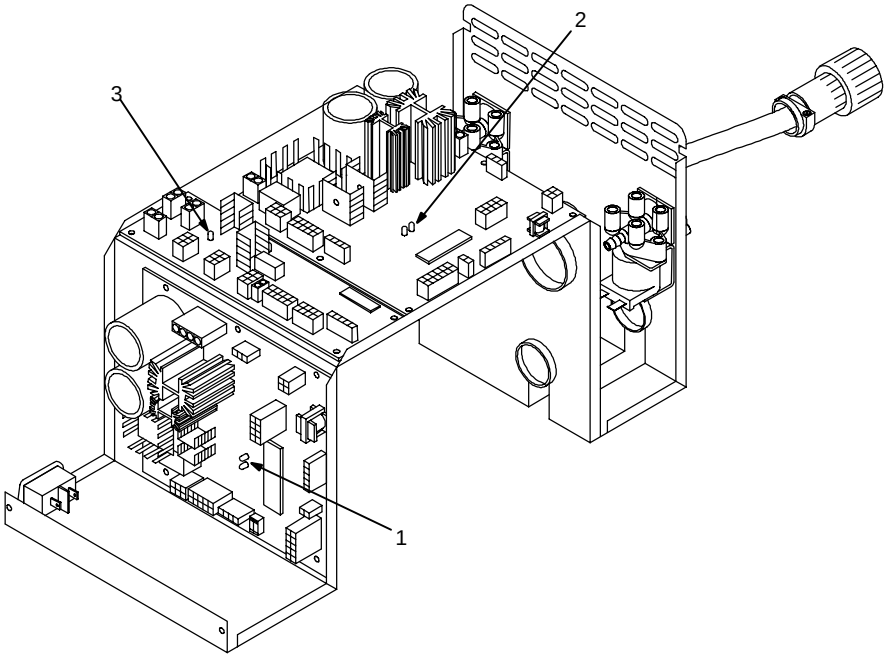
## 6-2. Diagnostics



1 LED3 On Right Side Motor Control Board PC1

2 LED3 On Left Side Motor Control Board PC101

3 LED3 On Dual Board PC70




803 063-A

| | Display On Optional Meter | LED3 Sequence | Indicated Error |
|---|---|---|---|
| **Left Side Motor Control Board PC101** | HELP 11 | 1 Blink | Communication Error |
| | HELP 12 | 2 Blinks | Trigger Error |
| | HELP 13 | 3 Blinks | Tach Error |
| | HELP 14 | *4 Blinks | Motor Error |
| **Right Side Motor Control Board PC1** | HELP 21 | 1 Blink | Communication Error |
| | HELP 22 | 2 Blinks | Trigger Error |
| | HELP 23 | 3 Blinks | Tach Error |
| | HELP 24 | *4 Blinks | Motor Error |
| **Dual Board PC70** | HELP 31 | *4 Blinks | Communication Error |
| | *Since blink On time and blink Off time are equal in a four-blink cycle, the four–blink sequence appears as constant blinking. | | |

- **Error Indications**

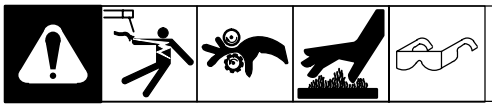
Error conditions are indicated by LED3 on PC1, PC101, PC70 or on display if meter option is present. To view LED3, turn Off unit, remove wrapper, and turn unit On. LED3 is most easily observed from the left side of the unit.

The LED blinks in a 2.5 second cycle. The number of blinks in this period indicates the type of error.

The priority of the errors is related to the number of blinks indicating the error. The more blinks, the more severe the error (motor error is top priority). A higher priority error overrides a lower one (if a motor error and a communication error existed, the light would blink four times for the motor error).

- **The communication error** occurs 2.5 seconds after a loss of communication between the motor and the optional meter board or Dual board. The user may continue to weld with this error. The error may be cleared by turning power Off, waiting a minimum of two seconds, and turning power On.
- **The trigger error** occurs if the user has the trigger held for more than two minutes without striking an arc (providing current override is not enabled), or if the user holds the trigger past the postflow phase in a timed weld. This error also occurs if the trigger is held when the feeder is powered up. The error may be cleared by releasing the trigger.
- **The tach error** occurs 2 seconds after the loss of tachometer feedback. The user may continue to weld with this error. The motor speed is regulated through the monitoring of voltage and current.
- **The motor error** indicates that the motor has been drawing too much current for too long.

## 6-3. Troubleshooting



▲ **Disconnect power before troubleshooting**

| Trouble | Remedy |
|---|---|
| Wire feeds, shielding gas flows, but electrode wire is not energized. | Check cable connections. Check cables for continuity, and repair or replace cables if necessary (see Section 4-3). |
| Wire feeder is on, display does not light up, motor does not run, gas valve and welding power source contactor do not pull in. | Check and reset circuit breaker at welding power source. |
| Electrode wire feeding stops or feeds erratically during welding. | Check gun trigger connection. See gun Owner's Manual. |
| | Check gun trigger. See gun Owner's Manual. |
| | Readjust hub tension and drive roll pressure (see Section 4-7). |
| | Change to correct size drive roll (see 4-7). |
| | Clean or replace dirty or worn drive roll. |
| | Incorrect size or worn wire guides. |
| | Replace contact tip or liner. See gun Owner's Manual. |
| | Remove weld spatter or foreign matter from around nozzle opening. |
| | Have Factory Authorized Service Agency check drive motor or motor control board PC1. |
| Wire birdnests between feeder and gun. | Gun liner has to large of diameter opening, is clogged, or the end of the gun is not close enough to the front set of drive rolls. |
| Motor runs slowly. | Check for correct input voltage. |
| Unit does not switch out of Run-In Speed. | Check if a power source is being used that doesn't provide current feedback through the 14-pin receptacle (pins F & H). If this is the case, use internal DIP switches to set current detect override to On (see Section 4-8). |
| Wire feeder power is on, displays light up, but unit is inoperative. | Check welding gun trigger leads for continuity, and repair leads or replace gun. |

# Notes

# SECTION 7 – ELECTRICAL DIAGRAM

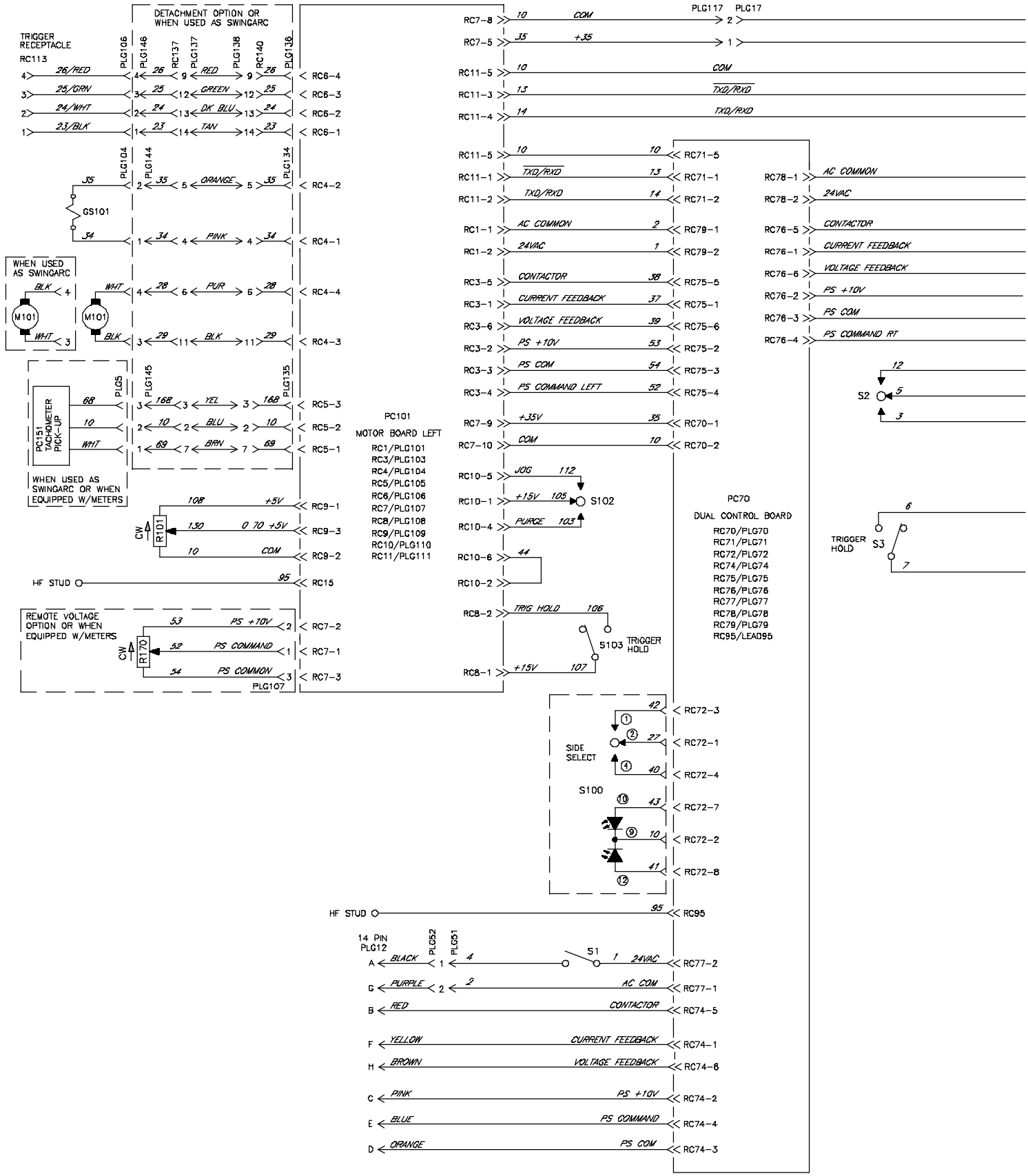
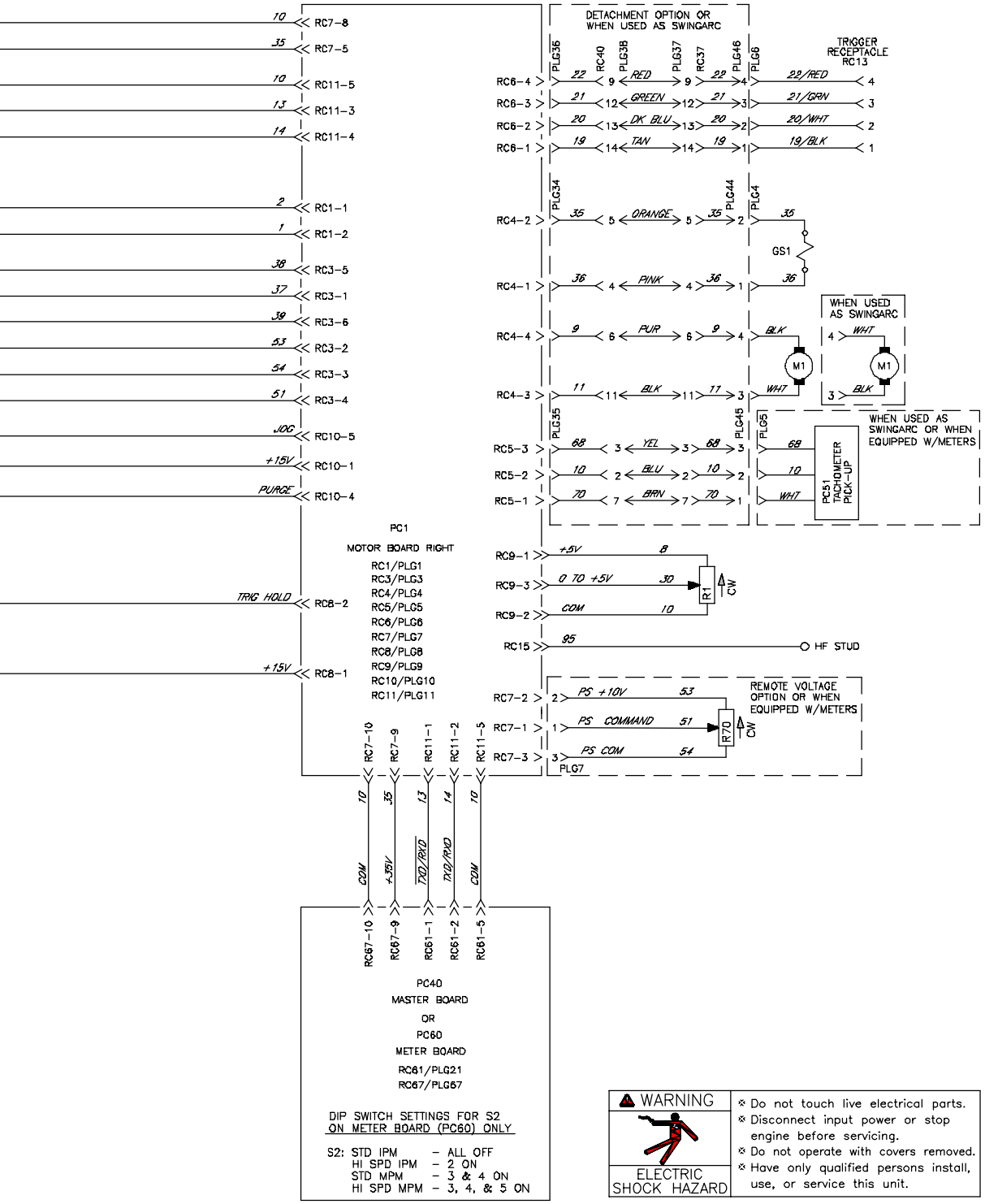



**Figure 7-1. Circuit Diagram**


DETACHMENT OPTION OR WHEN USED AS SWINGARC
TRIGGER RECEPTACLE RC13
PLG36
PLG38
PLG37
PLG46
PLG66
RC40
RC37
RC6-4
RC6-3
RC6-2
RC6-1
22/RED
21/GRN
20/WHT
19/BLK
RED
GREEN
DK BLU
TAN
PLG34
PLG44
PLG4
RC4-2
RC4-1
RC4-4
RC4-3
ORANGE
PINK
PUR
BLK
WHT
GS1
M1
WHEN USED AS SWINGARC
PLG35
PLG45
PLG5
RC5-3
RC5-2
RC5-1
YEL
BLU
BRN
PC51 TACHOMETER PICK-UP
WHEN USED AS SWINGARC OR WHEN EQUIPPED W/METERS
RC7-8
RC7-5
RC11-5
RC11-3
RC11-4
RC1-1
RC1-2
RC3-5
RC3-1
RC3-6
RC3-2
RC3-3
RC3-4
RC10-5
RC10-1
RC10-4
RC8-2
RC8-1
JOG
+15V
PURGE
TRIG HOLD
PC1
MOTOR BOARD RIGHT
RC1/PLG1
RC3/PLG3
RC4/PLG4
RC5/PLG5
RC6/PLG6
RC7/PLG7
RC8/PLG8
RC9/PLG9
RC10/PLG10
RC11/PLG11
RC9-1
RC9-3
RC9-2
+5V
0 TO +5V
COM
R1
CW
RC15
HF STUD
REMOTE VOLTAGE OPTION OR WHEN EQUIPPED W/METERS
RC7-2
RC7-1
RC7-3
PS +10V
PS COMMAND
PS COM
R70
PLG7
RC7-10
RC7-9
RC11-1
RC11-2
RC11-5
COM
+35V
TXD/RXD
TXD/RXD
COM
RC67-10
RC67-9
RC61-1
RC61-2
RC61-5
PC40
MASTER BOARD
OR
PC60
METER BOARD
RC61/PLG21
RC67/PLG67
DIP SWITCH SETTINGS FOR S2
ON METER BOARD (PC60) ONLY
S2: STD IPM – ALL OFF
HI SPD IPM – 2 ON
STD MPM – 3 & 4 ON
HI SPD MPM – 3, 4, & 5 ON
WARNING
ELECTRIC SHOCK HAZARD
Do not touch live electrical parts.
Disconnect input power or stop engine before servicing.
Do not operate with covers removed.
Have only qualified persons install, use, or service this unit.

204 716-B

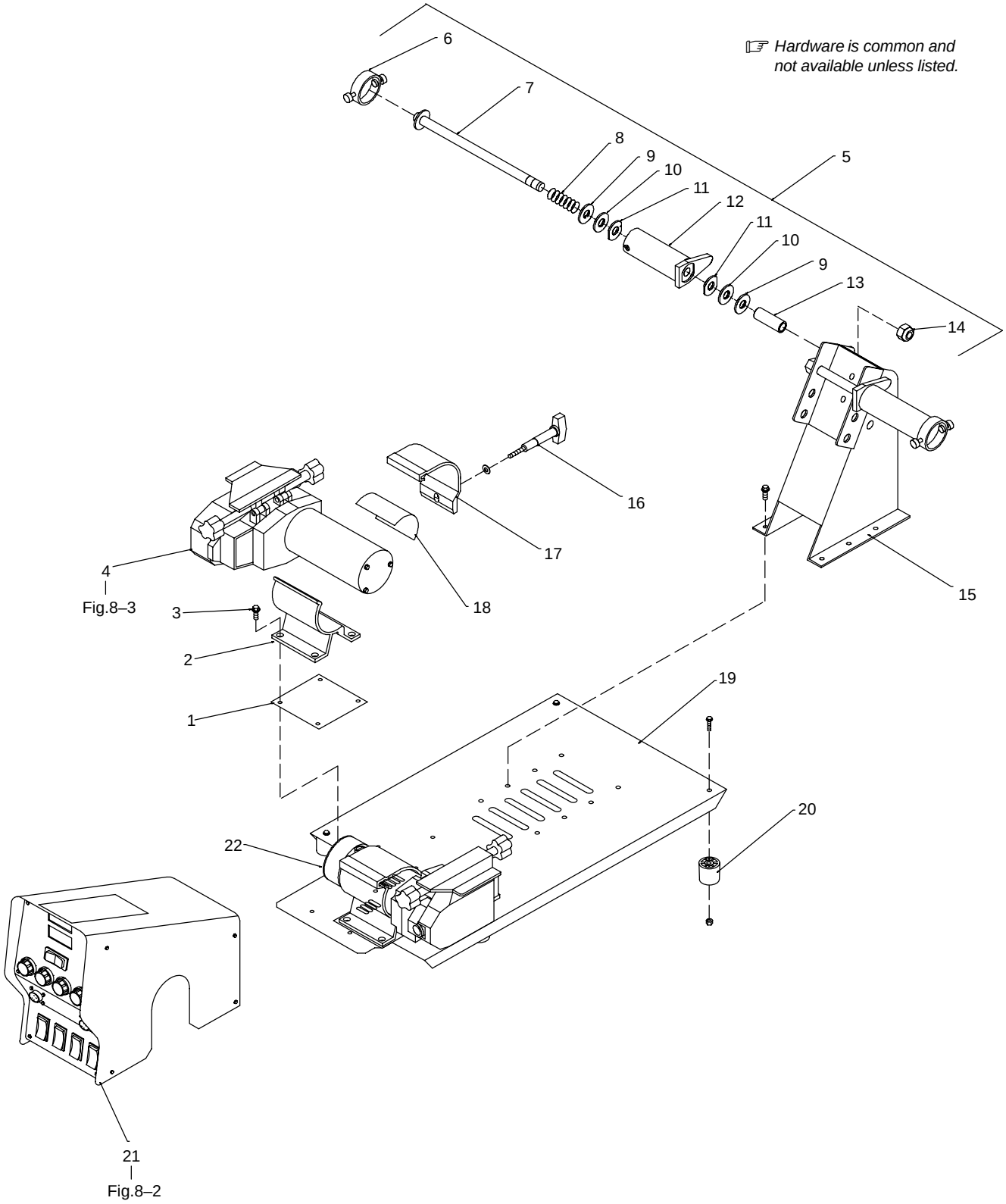



**Figure 8-1. Main Assembly**

| Item No. | Part No. | Description | Quantity |
|---|---|---|---|

**Figure 8-1. Main Assembly**

| | | | |
|---|---|---|---|
| 1 | 159 647 | Insulator, Motor Clamp | 2 |
| 2 | 159 646 | Clamp, Motor Base | 2 |
| 3 | 159 360 | Insulator, Screw Machine | 8 |
| 4 | 201 761 | Drive Assy, Wire S/L 4 Roll | 1 |
| 4 | 201 763 | Drive Assy,Wire S/L 4 Roll Hi–Speed W/Tach | 1 |
| 5 | 143 160 | Hub+Spindle Assy, (Consisting Of) | 2 |
| 6 | 058 427 | Ring, Retaining Spool | 1 |
| 7 | 180 576 | Shaft, Support Spool | 1 |
| 8 | 010 233 | Spring, Cprsn .970 Od X .120 Wire X 1.250pld | 1 |
| 9 | 057 971 | Washer, Flat Stl Keyed 1.500 dia X .125thk | 2 |
| 10 | 010 191 | Washer, Fbr .656 Id X 1.500 Od X .125thk | 2 |
| 11 | 058 628 | Washer, Brake Stl | 2 |
| 12 | 058 428 | Hub, Spool | 1 |
| 13 | 071 730 | Tubing, STL .875 Od X 12Ga Wall X 2.500 | 2 |
| 14 | 135 205 | Nut, Stl Slflkg Hex Reg .625-11 W/Nylon Insert | 1 |
| 15 | 141 411 | Support, Spool | 1 |
| 16 | 208 339 | Extension, Dual Clamp L.H. | 1 |
| 16 | 208 338 | Extension, Dual Clamp R.H. | 1 |
| 17 | 156 243 | Clamp, Motor Top | 2 |
| 18 | 145 639 | Strip, Buna–n .062 X 3.000 X 4.000 Compressed Sht | 2 |
| 19 | 139 226 | Base | 1 |
| 20 | 134 306 | Foot, Rubber 1.250 Dia X 1.375 High No 10 Screw | 4 |
| 21 | | Control Box (Refer to Figure 8-2) | 1 |
| 22 | 201 767 | Drive Assy, Wire R 4 Roll | 1 |
| 22 | 201 769 | Drive Assy,Wire R 4 Roll Hi–Speed W/Tach | 1 |

+When ordering a component originally displaying a precautionary label, the label should also be ordered.
**To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.**

☞ *Hardware is common and not available unless listed.*

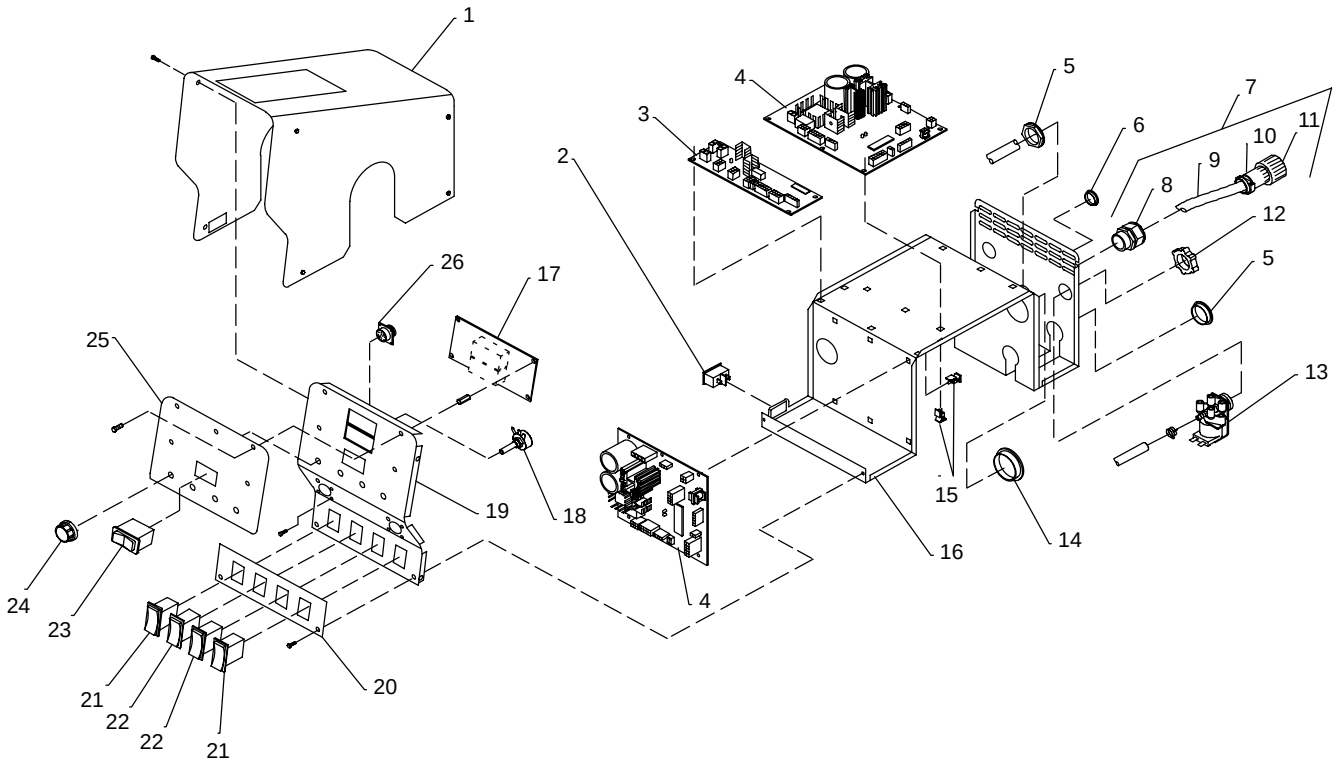



**Figure 8-2. Control Box**

| Item No. | Dia. Mkgs. | Part No. | Description | Quantity Model D-74S | Quantity Model D-74D |
|---|---|---|---|---|---|
| **Figure 8-2. Control Box (Figure 8-1 Item 21)** | | | | | |
| 1 | | 204 722 | Wrapper, feeder | 1 | 1 |
| | | 134 464 | Label,Warning General Precautionary Static&wire Fe | 1 | 1 |
| | | 178 936 | Label,Warning General Precautionary Wordless Ce Wf | 1 | 1 |
| 2 | S1 | 111 997 | Switch, Rocker Spst 10A 250vac On-Off Visi Red Rock | 1 | 1 |
| 3 | PC70 | 207 419 | Circuit Card Assy, Dual W/Program | 1 | 1 |
| 4 | PC1, PC101 | 208 185 | Circuit Card Assy, Motor Control W/Program | 2 | 2 |
| 5 | | 030 170 | Bushing,Snap–in Nyl .750 Id X 1.000 Mtg Hole | 2 | 2 |
| 6 | | 000 527 | Blank, Snap–in Nyl .875 Mtg Hole Black | 1 | 1 |
| 7 | | 200 196 | Cable, Power 16.5ft 8/c 2-14ga 6-18ga (consisting of) | 1 | 1 |
| 8 | | 139 041 | Strain Relief | 1 | 1 |
| 9 | | 163 519 | Cable, Port | 16.5 ft | |
| 10 | | 079 739 | Conn, circ cpc clamp str rlf | 1 | 1 |
| 11 | PLG12 | 141 162 | Housing Plug+Pins, (service kit) | 1 | 1 |
| | PLG52 | 174 823 | Housing Plug Pins+Skts, (service kit) | 1 | 1 |
| | PLG74 | 115 093 | Housing Plug+Skts, (service kit) | 1 | 1 |
| 12 | | 605 227 | Nut, 750–14 Knurled1.68dia .41h Nyl | 2 | 2 |
| 13 | GS1, GS101 | 200 333 | Valve, 34vdc 2way Custom Port 1/8 Orf W/Frict | 2 | 2 |
| 14 | | 010 494 | Bushing, Snap–in Nyl 1.375 Id X 1.750 Mtg Hole | 2 | 2 |
| 15 | | 134 201 | Stand–off Support, Pc Card .312/.375w/Post&lock .43 | 17 | 17 |
| 16 | | 204 721 | Enclosure, Control | 1 | 1 |
| 17 | PC60 | 208 190 | Circuit Card Assy, Meter W/Program | 0 | 1 |
| 17 | PC40 | 208 323 | Circuit Card Assy, Master W/Program D-74 | 1 | 0 |

| Item No. | Dia. Mkgs. | Part No. | Description | Quantity Model D-74S | Quantity Model D-74D |
|---|---|---|---|---|---|
| **Figure 8-2. Control Box (Continued)** | | | | | |
| 18 | R1, R101 | 073 562 | Potentiometer, cp std slot 1t 2. w 10k linear D-74S | 2 | 0 |
| 18 | R1, 101, 70, 170 | 603 856 | Potentiometer, ww sltd sft 10/t 2w 10k ohm D-74D | 0 | 4 |
| 19 | | 204 723 | Panel, Front | 1 | 1 |
| 20 | | 204 724 | Nameplate, Miller Lower | 1 | 1 |
| 20 | | 207 428 | Nameplate, Lower (CE Version) | 1 | 1 |
| 21 | S2, S102 | 200 295 | Switch, rocker spdt 15A 12V (on)–off–(on) | 2 | 2 |
| 22 | S3, S103 | 201 642 | Switch, rocker spdt 15A 12V on–none–on | 2 | 2 |
| 23 | S100 | 201 641 | Switch, rocker spdt 15A 12V (on)–off–(on) W/leds | 1 | 1 |
| 24 | | 193 919 | Knob, pointer 1.250 dia x .250 id w/two set screws | 4 | 4 |
| 25 | | 206 513 | Nameplate, Miller D-74S Upper | 1 | 0 |
| 25 | | 206 511 | Nameplate, Miller D-74D Upper | 0 | 1 |
| 25 | | 207 431 | Nameplate, Upper (CE Version) D-74S | 1 | 0 |
| 25 | | 207 433 | Nameplate, Upper (CE Version) D-74D | 0 | 1 |
| 26 | RC13, RC113 | 048 282 | RCPT w/skts, (service kit) | 2 | 2 |

+When ordering a component originally displaying a precautionary label, the label should also be ordered.

**To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.**

| Dia. Mkgs. | Part No. | Description | Quantity |
|---|---|---|---|
| **Harness Connectors/Receptacles** | | | |
| PLG6,106 | 115 094 | Housing Plug+Skts, (service kit) | 1 |
| PLG4,104 | 136 810 | Housing Plug+Skts, (service kit) | 1 |
| PLG72 | 115 092 | Housing Plug+Skts, (service kit) | 1 |
| PLG9,109 | 201 665 | Housing Plug+Skts, (service kit) | 1 |
| PLG11, 21,71,111 | 131 055 | Housing Rcpt+Skts, (service kit) | 1 |
| PLG7,67,107 | 115 091 | Housing Plug+Skts, (service kit) | 1 |
| PLG17,70 | 158 719 | Housing Plug+Skts, (service kit) | 1 |
| PLG117 | 165 404 | Housing Rcpt+Skts, (service kit) | 1 |
| PLG1,77,78,79,101 | 202 592 | Housing Plug+Skts, (service kit) | 1 |
| PLG3,75,76,103 | 115 093 | Housing Plug+Skts, (service kit) | 1 |
| PLG51 | 174 824 | Housing Plug Pins+Skts, (service kit) | 1 |
| PLG8,108 | 131 054 | Housing Rcpt+Skts, (service kit) | 1 |
| PLG10,110 | 130 203 | Housing Plug+Skts, (service kit) | 1 |

☞ *Hardware is common and not available unless listed.*

See Table 8-1 For Drive Roll & Wire Guide Kits

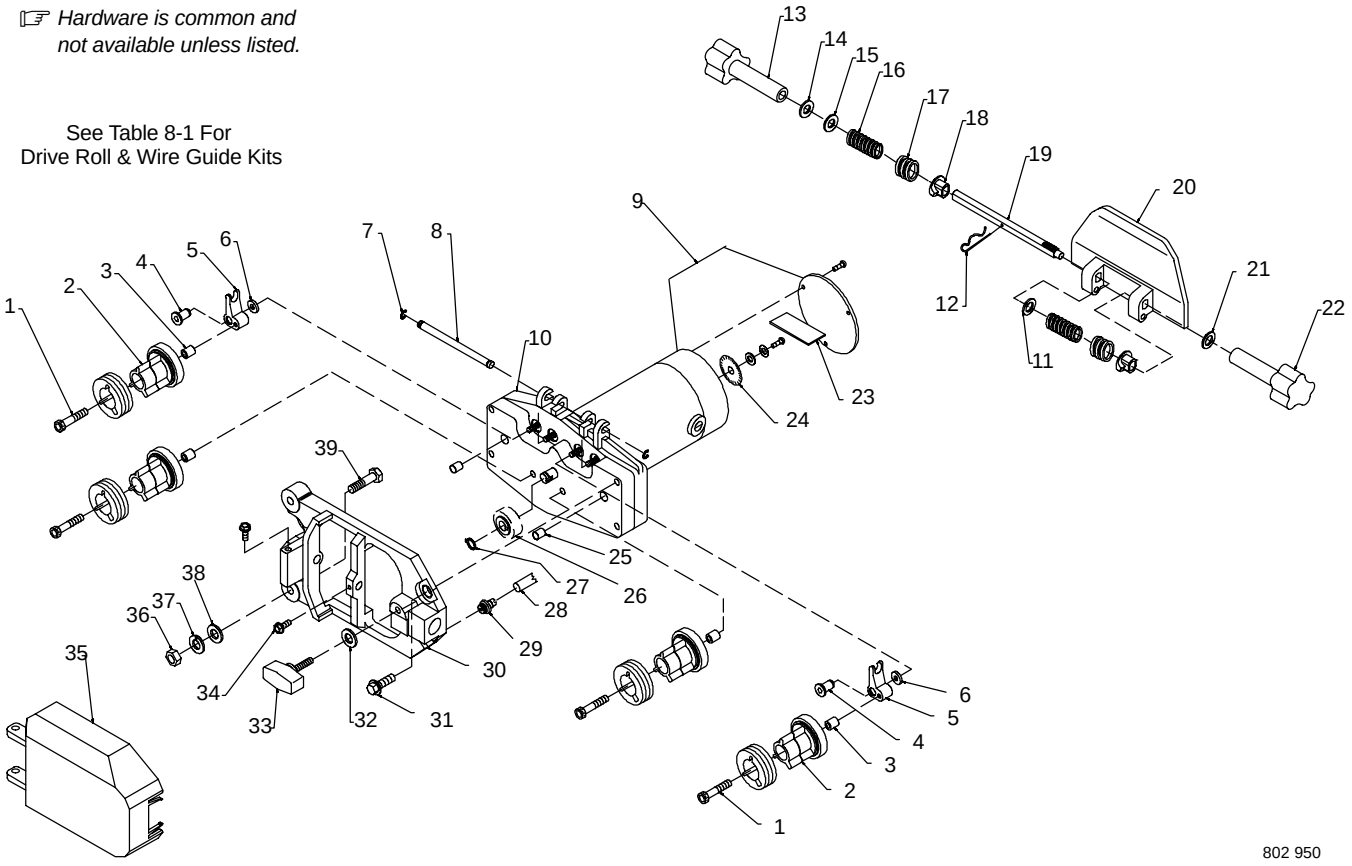



**Figure 8-3. Drive Assembly, Wire**

| Item No. | Dia. Mkgs. | Part No. | Description | Quantity Model D-74S | Quantity Model D-74D |
|---|---|---|---|---|---|
| | | | **Figure 8-3. Drive Assembly, Wire (Figure 8-1 Item 4)** | | |
| 1 | | 010 668 | .. Screw, Cap Stl Sch .250-20 X 1.500 | 4 | 4 |
| 2 | | 172 075 | .. Carrier, Drive Roll W/Components | 4 | 4 |
| 3 | | 149 962 | .. Spacer, Carrier Drive Roll | 4 | 4 |
| 4 | | 149 486 | .. Pin, Rotation Arm Rocker | 2 | 2 |
| 5 | | 132 750 | .. Arm, Pressure | 2 | 2 |
| 6 | | 150 520 | .. Spacer, Flat Stl .257 Id X .619 Od X .105 | 2 | 2 |
| 7 | | 133 493 | .. Ring, Retaining Ext .250 Shaft X .025thk | 2 | 2 |
| 8 | | 133 350 | .. Pin, Hinge | 1 | 1 |
| 9 | M1,101 | 201 230 | .. Motor, Gear 1/8hp 24vdc Standard Speed | 1 | 1 |
| 9 | M1,101 | 201 231 | .. Motor, Gear 1/8hp 24vdc High Speed | 1 | 1 |
| | | 153 491 | .... Kit, Brush Replacement (Consisting Of) | 1 | 1 |
| | | 153 492 | ..... Cap, Brush | 2 | 2 |
| | | *153 493 | ..... Brush, Carbon | 2 | 2 |
| | | 184 136 | .... Kit, Brush Holder Replacement | 1 | 2 |
| 10 | | 155 098 | .. Kit, Cover Motor Gearbox (Consisting Of) | 1 | 1 |
| | | 153 550 | .... Cover, Motor Gearbox (Consisting Of) | 1 | 1 |
| | | 155 099 | ..... Gasket, Cover | 1 | 1 |
| | | 155 100 | ..... Screw, Cover | 5 | 5 |
| | | 154 031 | .... Spacer, Locating | 2 | 2 |
| | | 133 493 | .... Ring, Rtng Ext .250 Shaft Grv X .025thk | 1 | 1 |

| Item No. | Dia. Mkgs. | Part No. | Description | Quantity Model D-74S | Quantity Model D-74D |
|---|---|---|---|---|---|
| | | | **Figure 8-3. Drive Assembly, Wire (Continued)** | | |
| | | 203 642 | . . Pressure Arm,R & Vert L 4 Roll (consisting of) | 1 | 1 |
| | | 203 631 | . . Pressure Arm,S/L & Vert S/R 4 Roll (consisting of) | 1 | 1 |
| 11 | | 182 414 | . . . . Washer, Flat | 1 | 1 |
| 12 | | 182 415 | . . . . Pin, Cotter Hair | 1 | 1 |
| 13 | | 203 640 | . . . . Knob, W/Extension Short Pressure Arm | 1 | 1 |
| 14 | | 602 200 | . . . . Washer, Lock Stl Split No. 8 | 1 | 1 |
| 15 | | 604 772 | . . . . Washer, Flat Stl Sae No. 8 | 1 | 1 |
| 16 | | 182 156 | . . . . Spring, Cprsn | 4 | 4 |
| 17 | | 182 155 | . . . . Spring | 2 | 2 |
| 18 | | 132 746 | . . . . Bushing, Spring | 2 | 2 |
| 19 | | 203 633 | . . . . Shaft, Spring | 1 | 1 |
| 20 | | 203 632 | . . . . Carrier, Shaft | 1 | 1 |
| 21 | | 133 739 | . . . . Washer, Flat Buna .375 Id X .625 Od X .062thk | 1 | 1 |
| 22 | | 203 637 | . . . . Knob, W/Extension Long Pressure Arm | 1 | 1 |
| 23 | PC51,151 | 201 225 | . . Circuit Card, Digital Tach (consisting of) | 0 | 2 |
| | PLG5 | 131 204 | . . . . Connector & Sockets | 0 | 1 |
| | | 604 311 | . . . . Grommet, Rbr .250 Id X .375mtg Hole .062 Groove | 0 | 1 |
| 24 | | 132 611 | . . Optical Encoder Disc | 0 | 1 |
| | | 603 115 | . . Weather Stripping, Adh .125 X .375 | 0 | 1 |
| 25 | | 167 387 | . . Spacer, Locating | 2 | 2 |
| 26 | | 168 825 | . . Drive, Pinion | 1 | 2 |
| 27 | | 133 308 | . . Ring, Retaining Ext .375 Shaft X .025thk | 1 | 1 |
| 28 | | 134 834 | . . Hose, Sae .187 Id X .410 Od (order by ft) | 2 Ft | |
| 29 | | 149 959 | . . Fitting, Brs Barbed M 3/16tbg X .312-24 | 1 | 1 |
| 30 | | 179 265 | . . Adapter, Gun/Feeder LH | 1 | 1 |
| 30 | | 179 264 | . . Adapter, Gun/Feeder RH | 1 | 1 |
| 31 | | 108 940 | . . Screw, Cap Stl Hexhd .250-20 X .750 | 4 | 4 |
| 32 | | 604 538 | . . Washer, Flat Stl Sae .312 | 1 | 1 |
| 33 | | 151 437 | . . Knob, Plstc T 1.125 Lg X .312-18 X 1.500 | 1 | 1 |
| 34 | | 151 290 | . . Screw, Mach Stl Hexwhd 10-32 X .500 | 2 | 2 |
| 35 | | 179 277 | . . Cover, Drive Roll (consisting of) | 1 | 1 |
| | | 178 937 | . . . . Label, Warning Electric Shock | 1 | 1 |
| 36 | | 601 872 | . . Nut, Stl Hex Full Fnsh .375-16 | 1 | 1 |
| 37 | | 602 213 | . . Washer, Lock Stl Split .375 | 1 | 1 |
| 38 | | 602 243 | . . Washer, Flat Stl Std .375 | 1 | 1 |
| 39 | | 601 966 | . . Screw, Cap Stl Hexhd .375-16 X 1.250 | 1 | 1 |

*Recommended Spare Parts.

**To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.**

## Table 7-1. Drive Roll And Wire Guide Kits

| Wire Size | | Inlet Guide | Intermediate Guide | V-GROOVE | | U-GROOVE | | VK-GROOVE | | UC-GROOVE | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Fraction | Metric | | | 4 Roll Kit | Drive Roll | 4 Roll Kit | Drive Roll | 4 Roll Kit | Drive Roll | 4 Roll Kit | Drive Roll |
| .023-.025 in. | 0.6 mm | 150 993 | 149 518 | 151 024 | 087 130 | | | | | | |
| .030 in. | 0.8 mm | 150 993 | 149 518 | 151 025 | 053 695 | | | | | | |
| .035 in. | 0.9 mm | 150 993 | 149 518 | 151 026 | 053 700 | 151 036 | 072 000 | 151 052 | 132 958 | | |
| .040 in. | 1.0 mm | 150 993 | 149 518 | 161 190 | | | | | | | |
| .045 in. | 1.1/1.2 mm | 150 994 | 149 519 | 151 027 | 053 697 | 151 037 | 053 701 | 151 053 | 132 957 | 151 070 | 083 489 |
| .052 in. | 1.3/1.4 mm | 150 994 | 149 519 | 151 028 | 053 698 | 151 038 | 053 702 | 151 054 | 132 956 | 151 071 | 083 490 |
| 1/16 in. (.062 in.) | 1.6 mm | 150 995 | 149 520 | 151 029 | 053 699 | 151 039 | 053 706 | 151 055 | 132 955 | 151 072 | 053 708 |
| .068-.072 in. | 1.8 mm | 150 995 | 149 520 | | | | | 151 056 | 132 959 | | |
| 5/64 in. (.079 in.) | 2.0 mm | 150 995 | 149 520 | | | 151 040 | 053 704 | 151 057 | 132 960 | 151 073 | 053 710 |
| 3/32 in. (.094 in.) | 2.4 mm | 150 996 | 149 521 | | | 151 041 | 053 703 | 151 058 | 132 961 | 151 074 | 053 709 |
| 7/64 in. (.110 in.) | 2.8 mm | 150 996 | 149 521 | | | 151 042 | 053 705 | 151 059 | 132 962 | 151 075 | 053 711 |
| 1/8 in. (.125 in.) | 3.2 mm | 150 997 | 149 522 | | | 151 043 | 053 707 | 151 060 | 132 963 | 151 076 | 053 712 |

Each Kit Contains An Inlet Guide, Intermediate Guide, And 045 233 Antiwear Guide w/604 612 Setscrew 8-32 x .125, along with 4 Drive Rolls.

Ref. S-0527-C

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## Effective January 1, 2001
## (Equipment with a serial number preface of "LB" or newer)

This limited warranty supersedes all previous Miller warranties and is exclusive with no other guarantees or warranties expressed or implied.

LIMITED WARRANTY – Subject to the terms and conditions below, Miller Electric Mfg. Co., Appleton, Wisconsin, warrants to its original retail purchaser that new Miller equipment sold after the effective date of this limited warranty is free of defects in material and workmanship at the time it is shipped by Miller. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

Within the warranty periods listed below, Miller will repair or replace any warranted parts or components that fail due to such defects in material or workmanship. Miller must be notified in writing within thirty (30) days of such defect or failure, at which time Miller will provide instructions on the warranty claim procedures to be followed.

Miller shall honor warranty claims on warranted equipment listed below in the event of such a failure within the warranty time periods. All warranty time periods start on the date that the equipment was delivered to the original retail purchaser, or one year after the equipment is sent to a North American distributor or eighteen months after the equipment is sent to an International distributor.

1. 5 Years Parts – 3 Years Labor
   * Original main power rectifiers
   * Inverters (input and output rectifiers only)
2. 3 Years — Parts and Labor
   * Transformer/Rectifier Power Sources
   * Plasma Arc Cutting Power Sources
   * Semi-Automatic and Automatic Wire Feeders
   * Inverter Power Supplies
   * Intellitig
   * Engine Driven Welding Generators **(NOTE: Engines are warranted separately by the engine manufacturer.)**
3. 1 Year — Parts and Labor
   * DS-2 Wire Feeder
   * Motor Driven Guns (w/exception of Spoolmate Spoolguns)
   * Process Controllers
   * Positioners and Controllers
   * Automatic Motion Devices
   * RFCS Foot Controls
   * Induction Heating Power Sources
   * Water Coolant Systems
   * HF Units
   * Grids
   * Maxstar 140
   * Spot Welders
   * Load Banks
   * Miller Cyclomatic Equipment
   * Running Gear/Trailers
   * Plasma Cutting Torches (except APT & SAF Models)
   * Field Options
     (NOTE: Field options are covered under True Blue® for the remaining warranty period of the product they are installed in, or for a minimum of one year — whichever is greater.)
4. 6 Months — Batteries
5. 90 Days — Parts
   * MIG Guns/TIG Torches
   * Induction Heating Coils and Blankets
   * APT, ZIPCUT & PLAZCUT Model Plasma Cutting Torches
   * Remote Controls
   * Accessory Kits
   * Replacement Parts (No labor)
   * Spoolmate Spoolguns
   * Canvas Covers

Miller's True Blue® Limited Warranty shall not apply to:

1. **Consumable components; such as contact tips, cutting nozzles, contactors, brushes, slip rings, relays or parts that fail due to normal wear.**
2. Items furnished by Miller, but manufactured by others, such as engines or trade accessories. These items are covered by the manufacturer's warranty, if any.
3. Equipment that has been modified by any party other than Miller, or equipment that has been improperly installed, improperly operated or misused based upon industry standards, or equipment which has not had reasonable and necessary maintenance, or equipment which has been used for operation outside of the specifications for the equipment.

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In the event of a warranty claim covered by this warranty, the exclusive remedies shall be, at Miller's option: (1) repair; or (2) replacement; or, where authorized in writing by Miller in appropriate cases, (3) the reasonable cost of repair or replacement at an authorized Miller service station; or (4) payment of or credit for the purchase price (less reasonable depreciation based upon actual use) upon return of the goods at customer's risk and expense. Miller's option of repair or replacement will be F.O.B., Factory at Appleton, Wisconsin, or F.O.B. at a Miller authorized service facility as determined by Miller. Therefore no compensation or reimbursement for transportation costs of any kind will be allowed.

TO THE EXTENT PERMITTED BY LAW, THE REMEDIES PROVIDED HEREIN ARE THE SOLE AND EXCLUSIVE REMEDIES. IN NO EVENT SHALL MILLER BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING LOSS OF PROFIT), WHETHER BASED ON CONTRACT, TORT OR ANY OTHER LEGAL THEORY.

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Please complete and retain with your personal records.

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Purchase Date (Date which equipment was delivered to original customer.)

Distributor

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City

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| | Technical Manuals (Servicing Information and Parts) |
| | Circuit Diagrams |
| | Welding Process Handbooks |
| Contact the Delivering Carrier for: | File a claim for loss or damage during shipment. |
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**Miller Electric Mfg. Co.**
An Illinois Tool Works Company
1635 West Spencer Street
Appleton, WI 54914 USA

**International Headquarters–USA**
USA Phone: 920-735-4505 Auto-Attended
USA & Canada FAX: 920-735-4134
International FAX: 920-735-4125

**European Headquarters – United Kingdom**
Phone: 44 (0) 1204-593493
FAX: 44 (0) 1204-598066

www.MillerWelds.com

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